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STEEL

ESTABLISHED 1882

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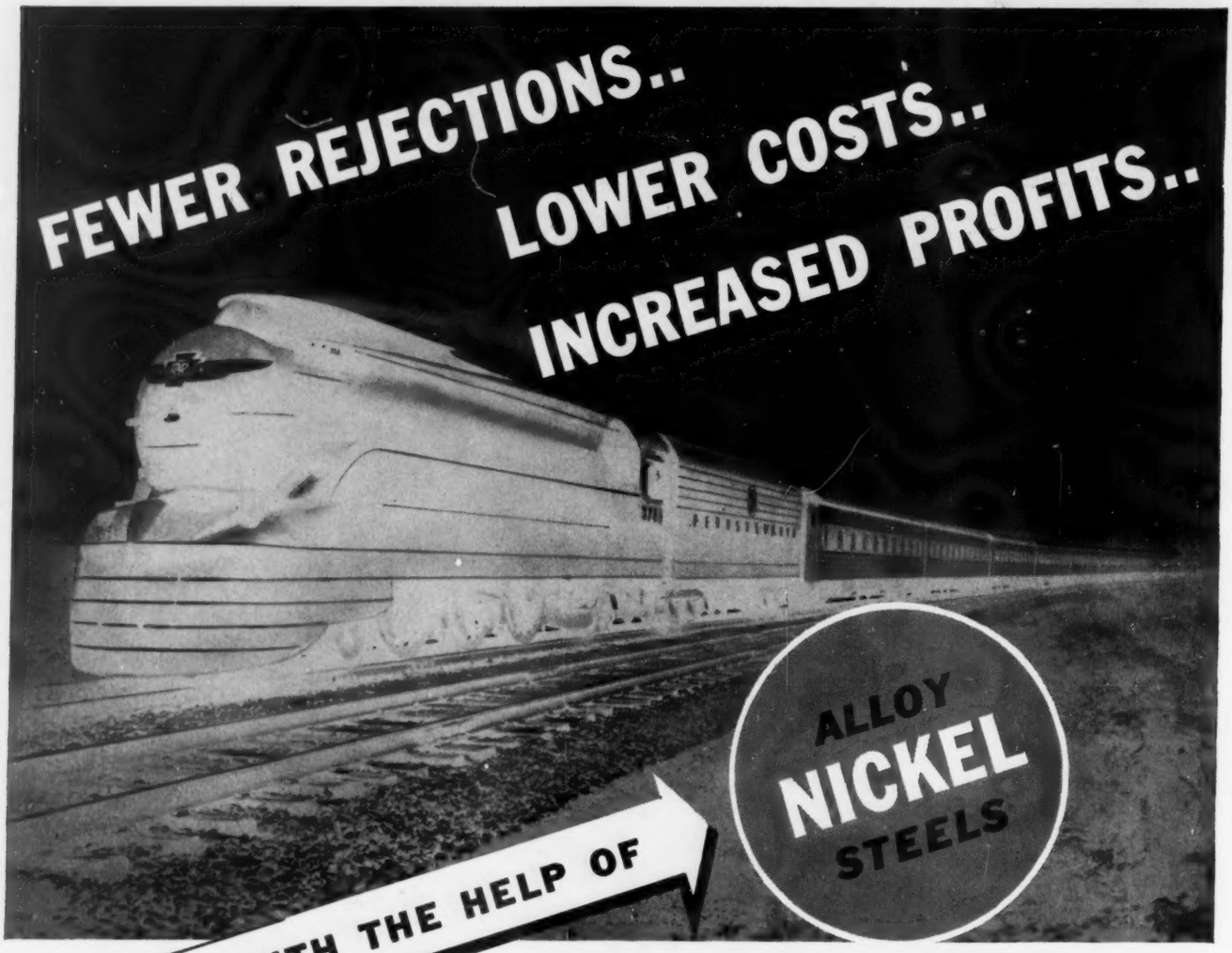
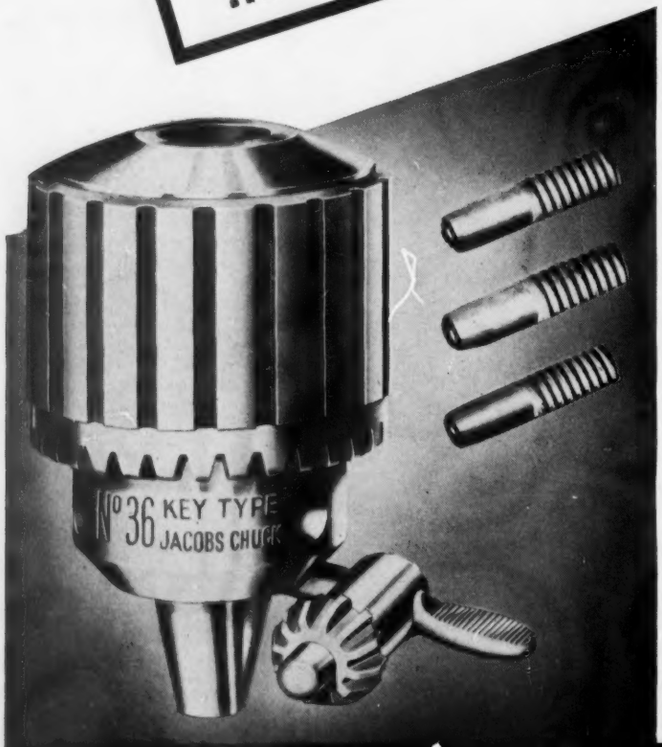
PRODUCTION • PROCESSING • DISTRIBUTION • USE

FEWER REJECTIONS.. LOWER COSTS.. INCREASED PROFITS..



..WITH THE HELP OF ALLOY NICKEL STEELS

MODERNISM brings new customers and new profits to railroads. Typical is the "Broadway Limited," leader of the Pennsylvania's fleet of nine new streamliners. From car truck frames of Nickel alloy cast steel to Nickel-copper-molybdenum steel roofs, Nickel saves weight, lengthens service life and pushes down cost per mile and cost per year.



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Nickel, alloyed into steels, irons or non-ferrous metals, provides improved mechanical properties. The heightened abilities of Nickel alloyed materials cut rejects during production, lower machining costs, and increase profits by lengthening service life. For specific information about money-saving applications of Nickel in your industry, please address your inquiry to the address below.

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THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N.Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ SEASONAL letdown in steel production is smaller this year than usual. Last week (p. 19) the rate declined 2 points to 90.5 per cent of ingot capacity. Christmas day observance will cause further reduction but prompt recovery is expected after the holidays. There are indications, however, that the industry (p. 59) has seen the peak in operations for the present. Present order backlogs, though large, will not again force output to the recent level. Export demand is expected to improve moderately. In tin plate, the outlook has been dimmed somewhat by the fact that British mills have been able to retain a large part of the world markets despite the war. Considerable business of varied character is expected from Canada where (p. 17) industry rapidly is mobilizing for war.

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Unwillingness of the United States to become an import nation is seen as a handicap (p. 15) to the development of permanent trade connections with South America. Though the war is swelling our South American business, this is only temporary unless we can see our way clear to invest capital in the South American countries in the willingness to let them repay us with goods and services rather than money. Students believe that we can build solidly for the future if we face the facts realistically. . . . Unemployment has declined (p. 25) for the third successive month; the jobless, however, still number 8,149,000. . . . Announcement of a new line of high-speed diesel crawler tractors, with several novel features (p. 17) was one of last week's significant developments.

Must Buy To Export

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Revision of the Wagner act and changes in the personnel of the national labor relations board seemed probable last week (p. 13) as the special congressional committee recessed its investigation of the act's administration. An astonishing story of blundering and indiscretion, of bias and finagling was revealed. . . . At Chicago (p. 16) union terrorism again has gained front-page prominence. At Pittsburgh SWOC served notice of cancellation of its contract with a steel fabricator on the ground its management had attempted to combat progress of CIO unions in general. The action ties in with CIO's current drive for the closed shop and checkoff on all holders of contracts. . . . In convening their recent meeting British steelmasters (p. 18) stood in silence in tribute to the late Charles M. Schwab.

See NLRB Revisions

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A new alloy for use in electrical contacts, particularly in heavy-duty control equipment, is said (p. 53) to have one-tenth the contact resistance of copper. . . . Magnesium, lightest of commercial structural metals, is expanding its field of applications. Due to its unusual characteristics (p. 36), this metal must be handled with unusual care in the foundry. . . . The same engineering principle which in automobiles minimizes the danger of skidding on wet and slippery pavements has made possible (p. 39) a new type of mechanical clutch. . . . Damage and loss of small parts during handling and assembly operations at an Ohio machine tool plant are eliminated (p. 41) by the use of truck-storage units which are loaded in the stockroom and wheeled to the assembly benches.

Magnesium Use Grows

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A new method of salvaging work rolls (p. 42) has been developed at a steel plant. They are turned down to size and flame hardened for use as tension rolls. Necks, shrunk with dry ice, are press fitted into the reclaimed rolls. . . . A ball-and-socket fixture (p. 45) has brought a 50 per cent reduction in the cost of arc welding the interlocking baffle plates in locomotive tender water tanks. . . . Slag cakes, when thoroughly understood and recognized (p. 48), permit short-cuts in obtaining desired quality in low-carbon rimming steel for strip; a metallurgist classifies them. . . . STEEL presents more versatile new machine tools (p. 34) which offer interesting potentialities for production lines. . . . A new book (p. 51) is devoted to welding of cast iron by the oxyacetylene process.

Work Rolls Salvaged

E C Kreutzberg

ORE FOR THE HEARTHS OF INLAND

Butting through cold, gray seas, Inland's fleet of ore boats plied its way this year until ice closed the lakes' highway. They have laid up huge stocks of ore at Indiana Harbor—an ample winter's supply for Inland's battery of modern blast furnaces. This is typical of the manner in which Inland is using, to capacity, every unit of its facilities—every resource of its man power—to satisfy the urgent needs of Inland's customers. Nor is mere tonnage enough; Inland products—as always—will meet the same high standards of quality that users have learned to expect from Inland.

INLAND STEEL CO.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Inquiry Strengthens Sentiment for Revising Labor Board and Act

Secretary Advised CIO on Strategy To Obtain Ruling Against Inland Steel, Even Before Complaint Was Filed; Manufacturers Insist on Twelve Amendments to "the Law"

WASHINGTON

■ REVISION of the Wagner act and changes in the national labor relations board's personnel appeared more than probable last week as the special congressional committee recessed its investigation of the act's administration.

Witnesses paraded before the committee an astonishing story of blundering and indiscretion, of bias and finagling by the board and its employes. Cases reviewed emphasized how loosely drawn and how susceptible to improper administration the act is.

Columns of testimony and editorials were published in newspapers throughout the country, carrying reports of the board's maladministration to the general public.

Industry, through the National Association of Manufacturers, renewed its campaign for revision, recommended 12 amendments.

Even John L. Lewis, Congress of Industrial Organizations' head, and William Green, president, American Federation of Labor, came out for changes in the act and the board—although, of course, for different changes and for different reasons.

Incompetence Charged

Under committee's hottest fire were Nathan Witt, the board's secretary whose dismissal for incompetence has been asked by board member William Leiserson, and Philip C. Phillips, regional director at Cincinnati.

Phillips admitted he had threatened to "get" an official of the Peter Pan Co., Winchester, Ky., that he had used his influence with newspaper guild friends to suppress stories unfavorable to the board, and that a CIO union had refused to drop a case before the board against Cincinnati Milling Machine Co. because the union was under "obligation to communists."

Witt, it was disclosed, had flown to Pittsburgh to confer with Philip Murray, Steel Workers Organizing committee chairman, and Lee Pressman, CIO general counsel, June 2, 1937, and had advised them on how to obtain a board ruling in the "Little Steel" strike. This was before any complaint had been filed with the board and before the board had any jurisdiction.

Committee counsel Edmund M. Toland read a memorandum from Witt to Charles Fahy, board counsel, in which the secretary revealed the procedure he had recommended to the CIO leaders. Witt testified he flew to Pittsburgh after a telephone request from the CIO chieftains and after he had laid the matter before the full board.

Witt said that after the conference the CIO changed its policy in line with the secretary's recommendations.

"I suggested that the quickest

"Make Industry Fear the Board"

■ **Fred Krivonos, left, national labor relations board investigator, talks with Nathan Witt, board secretary, during the congressional investigation of the Wagner act's administration. A former Cleveland regional director testified Krivonos, sometimes referred to as a member of the board's "goon" squad, instructed him to "make Ohio industry fear the board." Witt admitted advising CIO leaders in 1937 on how to obtain a ruling against Inland Steel Co., Chicago, before any complaint against the company had been filed. NEA photo**

way of getting a decision is for the SWOC to modify its approach on the majority question and instead of asking bargaining for its own members only, ask for exclusive bargaining on the basis of its claim to majority representation," Witt wrote the board attorney on June 3. "At the same time it could ask for negotiations looking toward a written agreement.

"All other things being equal, Inland (Steel Co., Chicago) would probably refuse the request on the ground that collective bargaining does not require a written agreement even if the parties come to an understanding on the provisions—as they apparently have on the basis of the Carnegie-Illinois (Steel Corp.) agreement. If at the same time it makes the demand, SWOC also offers to prove to Inland before the conference that it represents a majority, then Inland's refusal to negotiate on such a basis would lead to a claim by SWOC that section 8 had been violated."

CIO followed Witt's advice and Inland refused to grant exclusive bargaining. SWOC filed a charge. The board issued a complaint, held a hearing, ruled the steel company had violated the labor law by refusing, in advance of negotiations, to agree to sign a contract. Case now is before the circuit court of appeals at Chicago.

"This was strategy to entrap the Inland Steel Co.?" asked Representative Halleck, Indiana.

"No, I wouldn't put it that way," responded Witt.

"It's a conspiracy between the board and the SWOC," Toland interjected. Fahy rose from his chair and snapped: "You mean a conspiracy to enforce the law." Both remarks were stricken from the record.

Under questioning of Representatives Healey and Murdock from Massachusetts and Utah, respectively, Witt asserted that "consultations of this sort" are a "necessary procedure" for agencies such as the labor board.

"Consultations Are Legal"

"The board procedure requires that a charge be formally made before a complaint can be filed," observed Healey, "but there is nothing in the statute or regulations to preclude a consultation when there appears to be a violation of the act."

"Correct," said the witness.

After Toland had read a statement citing the law, regulations of the board and court cases involving "entrapment," Fahy received permission to speak in defense of the board's actions.

"The law does not forbid the board to consult with parties prior to the filing of charges, and I think it would be impossible to administer if the board were precluded from consultation with parties seeking their advice," Fahy declared. Adding that "this method of approach to enforcement of the law is not new," Fahy pointed out that other administrative and quasijudicial governmental agencies act in the same way.

James P. Miller, who headed the board's Cleveland office for a number of months, told the committee the board had fired him because he refused "to accept instructions to violate the law." He told the committee that he was let out of the organization "simply because I insisted the act should be administered impartially."

Miller testified that a member of the board's "goon squad," Special Examiner Fred Krivonos, had ordered him to make Ohio industry fear him and the NLRB.

Wagner Act Changes Seen

Charges against Miller, introduced into the committee record as reports and memoranda by board officials, accused the regional director of pro-employer bias, failure to understand the Wagner act, lack of vigor, "too compromising an attitude" and frequent angling after "a juicy job."

Edwin S. Smith, a board member, told the committee that Toland's suggestion that he (Smith) was prejudiced and biased in favor of the CIO, was "nonsense."

Accused of attempting to promote a union boycott of the Berkshire Knitting Mills, Reading, Pa., where a CIO strike was in progress but not yet under board jurisdiction, Smith insisted his only interest was to help settle the dispute.

When Toland introduced into the record a memorandum to Smith from David J. Saposs, NLRB economist, the board member registered "emphatic protest" against the "backhanded manner" in which his views were placed before the committee.

Memorandum urged deletion from a speech, to be delivered in April, 1937, of two paragraphs which Saposs said placed Smith "in a position of criticizing or condemning craft unionism."

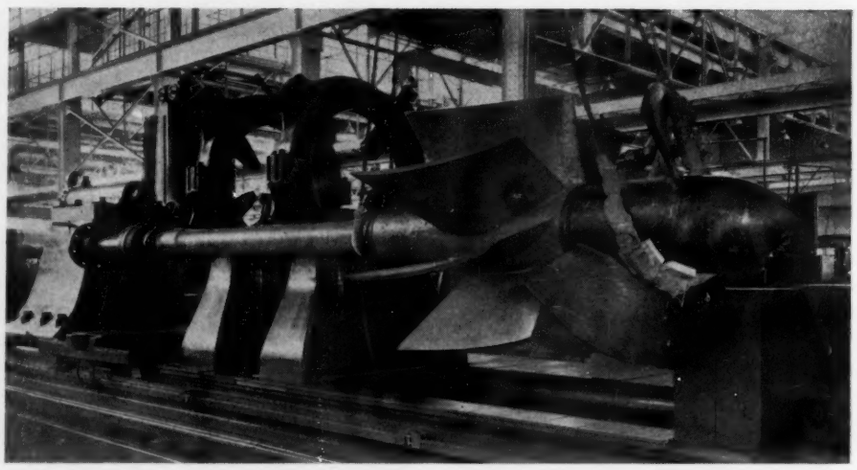
Smith told the committee his opinions on craft and industrial unionism were available in testimony before senate and house committees and decisions as a board member. These sources, he said, would furnish a fuller picture of his attitude than the "hints" in the Saposs memorandum.

As the committee recessed its hearings until Jan. 5, consensus here was that the investigators were striking "pay dirt," and that both the act and the board are due to face a withering attack in the next session of congress. Publicity attendant to the investigation has aroused public opinion, reports from many sections say, and congressmen probably will hear what the home folks think about the situation before they return to Washington in January.

Forecasts that the labor board and act, as now constituted, are doomed are heard frequently. That a fair and impartial industrial court may rise from its ruins also is be-

(*Please turn to Page* 72)

Match for 80 Fire Engines



■ **With capacity equal to 80 huge fire department pumpers, this vertical lift pump impeller sends 157,750 gallons of water a minute to the main powerhouse at Ford Motor Co.'s Rouge plant, Dearborn, Mich. Every day four of these pumps lift as much water to the steam condensers in the powerhouse as would be used by a great city in the same period. Impeller, which is 6 feet in diameter and 20 feet long, was photographed in the Ford tool and die shop while undergoing minor repairs**

U. S. Must Buy as Well as Sell To Expand Latin American Trade

■ STEEL export orders from Latin America have shown strong gains since Great Britain announced a blockade against German exports. Inquiry from the South American countries surged sharply upward in September following outbreak of war in Europe, then dwindled through October and November.

With German supplies cut off and most of Britain's steel production going into war *materiel*, South America naturally has turned to United States for iron and steel. Production in South America is practically nonexistent, and, although per capita consumption is small, the tonnage going to countries to the south is so much velvet to domestic mills. Germany and England, especially the former, recaptured the South American steel market following the last world conflict, by offering lower prices. During the World war, United States gained a large share of the South American steel market, but were undersold by European exports in the years following Versailles.

Steel exporters are more conservative than in 1914-18 in dealings with South American customers and few are taking all the market will bear in the way of price. While premium prices are being paid for most steel products going to South America, spread over going domestic business is not large or considered out of line in view of heavy demand in this country. Most exporters are adopting a policy by which they hope to hold Latin American customers after war in Europe ends.

Buying covers a wide range, but probably the heaviest gains have been registered by cast iron pipe, formerly furnished Latin America by France and Germany.

Seaboard Interests Active

Heavily sold position of steel mills recently, and pressure for domestic deliveries, have served to retard business with South America, and some orders have been refused. However, more open spots are appearing on mill schedules, and this probably will be taken up by export tonnage.

This situation has benefited jobbers near seaboard export centers. In New York they have been taking much more export business than usual.

Some South American interests are sending buyers to the United States to make direct purchases. A buyer representing five steel warehouses in Brazil has been in New York seeking tonnage from mills and jobbers. These warehouses formerly were supplied by Germany.

While export figures covering sales to South America for November are not yet available, tonnage is expected to approach the 39,936 tons shipped during October compared with 34,846 tons the previous month. Inquiries were heavier in September, but all the business offered was not taken. Brazil took 3498 tons of tin plate in October.

Southern steel producers, shipping through Mobile, Ala., and those on or near the South and mid-Atlantic seaboard are naturally benefiting to a larger degree in Latin American volume, having the advantage of lower freight. The bulk, practically all of steel business with these nations, is placed direct through exporters or with mills having representation in South America and the latter is being expanded. Little tonnage is placed through consulates or government agencies.

Shipping Facilities Influential

An important factor influencing service to South American steel buyers in this country is the abundance of shipping available to both the east and west coasts with more frequent sailings. This is due largely to withdrawal of American vessels from Europe's war zones.

Speculative tendency in buying which characterized the early upswing caused by the war abroad appears to be diminishing, due for the most part to foresighted price policies of most exporters and producers.

Greatest hindrances to trade expansion in South America are foreign exchange, commercial credits, limited export financing mediums and duty restrictions, especially in countries which have lost their European markets. Several South American countries now are modifying their import restrictions.

If the current administration policy results in devising new methods of co-operation between North and South America, a large potential future market for American iron and steel can be expected from the vast resources of South America awaiting development. This is especially true since many Latin American consumers prefer American products despite the higher price.

Most promising results, as far as permanent trade promotion is concerned, are offered by long-term investment. Latin America is rich in natural resources needing capital for their development. The United States is in an excellent position to supply the capital. Trade relations of this character would, if the existing credit problems could be solved, offer almost unlimited possibilities of lasting mutual advantage—such possibilities as were realized through the investment of European capital in the industrial development of the United States during the nineteenth century.

Such a program, however, say economic analysts, should be undertaken only with full recognition and acceptance of its long-term economic implications. Sooner or later, a creditor nation must become an importing nation; for in the long run it is only by accepting imports that a nation can receive payments of interest and principal on its foreign investments.

Economic Adjustment Necessary

The United States has not yet demonstrated its ability to adjust itself to this position. After the World war this country found itself in a creditor position and was able to sustain its role for several years without accepting payment in imports, by relending all that it received from abroad. But when the relending ceased, the payments could not be made; and serious international difficulties ensued.

Either immediately or in the long run, therefore, an expanding trade with Latin America must involve an expansion of imports as well as of exports. If the United States is able to adjust its internal economy and its economic psychology to this inescapable fact, it faces a rich opportunity to build up its trade relations in the western hemisphere on a permanent basis.

A trade policy of this kind would be far more beneficial in the end than a haphazard and opportunistic movement such as took place during the World war, with a subsequent loss of most of the progress made during the war years. The real opportunity that confronts the United States and Latin America today is that of building for the future.

BRITAIN LEADING SUPPLIER ARGENTINE R. R. EQUIPMENT

During 1935-1937, the last three years for which figures are available, Great Britain continued to be the Argentine's leading supplier of railway equipment, accounting for 30 per cent of the total imports, according to a survey by the department of commerce.

The United States in this period was the second largest supplier, with 25 per cent, followed by Belgium, 23 per cent; Germany, 13 per cent; France, 12 per cent; Hungary, 8 per cent; and Luxemburg, 7 per cent.

Current Events In Chicago . . .

By J. F. POWELL
Chicago Editor, STEEL

■ AFTER a period of quiet on the labor front here union terrorism again has gained front-page prominence.

The foreman of the enamel-baking department, G. M. Clark division, American Stove Co., Harvey, Ill., was waylaid by a dozen men and beaten a few nights ago. Regaining consciousness, he found he had signed a card and become a member of the Steel Workers' Organizing committee. The plant's SWOC unit denied it was in any way responsible.

The foreman, however, has pointed the finger at six of his fellow workers, all members of SWOC, and they have been apprehended, finger-printed and formally charged with conspiracy to commit asault.

Clashes between union and nonunion employes in the plant have become more numerous. Of 600 employes 450 are union members, while the foreman is reputedly leader of 150 nonmembers.

The difficulty does not involve contracts, collective bargaining, wage rates or check-off. The company negotiated a contract two years ago recognizing the union as bargaining agent for its members but providing that nonunion employes should not be intimidated. Now, however, police protection is found necessary for those employes who have not signed union membership cards. One worker, after being an eyewitness at the beating of the foreman, signed up with the union without further persuasion.

The union says its goal is 100 per cent unionization in the steelworking plants in the Chicago-Calumet district, where the stove company is located.

♦

Fund Contributions Larger

Community fund officials point with pride to large contributions from the Chicago steel industry. Executives and employes of International Harvester Co., Chicago, contributed $23,310, it was announced last week, in addition to a previous contribution of $60,000. Subsidiaries of United States Steel Corp., employes and executives, have subscribed $47,870, an increase of $4600 over last year. The subsidiary companies contributed $34,000 and the employes and executives $13,870. Included in the company subscriptions were American Bridge Co., $2550; American Steel & Wire Co., $2550; Carnegie-Illinois Steel Corp., $21,600; National Tube Co., $3650; Scully Steel Products Co., $1110; Universal Atlas Cement Co., $2500.

♦

Steel Traffic Separators

Chicago park district engineers have developed a use for structural steel in the form of traffic separators, to be installed on Lake Shore outer drive on the city's north side. Structural and concrete sections will be imbedded along the roadway where white lines now mark traffic lanes. During the rush hours, when it is desired to regulate the number of lanes carrying traffic in any one direction, the sections are to be raised 8 inches hydraulically. Each section calls for more than a ton of steel, 300 tons being required in the initial order for 225 of the separators. Equipment for raising and lowering the sections also will be needed.

♦

Exceed Theoretical Capacity

Based on actual steel output as compared with theoretical limits, 105 per cent, 109 per cent, and 112 per cent operations were attained at some plants this fall. In one week, five mills reported operations at 100 per cent or higher, four of them ranging from 104 to 115 per cent. Last week four mills estimated their operations in excess of 100 per cent of theoretical capacity, ranging from 103 per cent at one mill to more than 120 per cent at the busiest plant. A year and a half ago some of these mills were idling along as low as 12 per cent.

Trustee Appointed for Richardson & Boynton

■ Appointment of a reorganization trustee insures continued operation for Richardson & Boynton Co., manufacturer of heating equipment. More than a hundred years old, the firm has 500 employes. Offices and sales rooms are in New York; plants are at Utica and Buffalo, N. Y., and in Dover, N. J.

George R. Pfann, former assistant United States district attorney, was appointed to reorganize the company. He will work with Selden O. Martin, operating trustee, who was appointed temporarily to direct affairs when bankruptcy proceedings were filed last February. At that time creditors protested against liquidation of the firm, which had $2,500,000 assets, and petitioned it be permitted to go on.

David Richardson, descendant of the company's founder, is expected to continue in an executive capacity.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ HOLIDAY shutdowns will be welcome to some companies, among them operators of coal mines, beehive coke ovens and a few steel mills. This applies particularly to those having obsolete units which were pressed into service since September.

Numerous workers were called back into mills which operate only in times of emergency. Their employment is considered temporary.

Many steel men feel there was little need for the extreme measures employed in taking care of deliveries as quickly as was done. The better course, they say, might have been to accumulate greater backlogs and maintain production on an even keel. Strong tendencies in that direction are evident now. Some plants are attempting to hold production as close as possible to incoming orders. This will be more general after the year-end shutdowns.

United Engineering & Foundry Co., Pittsburgh, reports an order from Rustless Iron & Steel Corp., Baltimore, for a merchant mill, to be used in rolling stainless steel products in the Rustless plant now under construction.

♦

Sears Gets Corronizing License

Also announced last week was the licensing of Sears, Roebuck & Co. to use the Corronizing process. Standard Steel Spring Co., Coraopolis, Pa., developer of the new coating method, states the license covers any product manufactured for sale by Sears. Previously all licensees have been steel producers. With this action a wide variety of consumer goods industries will be able to use the process.

♦

SWOC Charges Anti-Union Move

Through its regional director, Clinton S. Golden, Steel Workers Organizing committee served ten-day notice, as provided in the union contracts, on the Verona, Pa., plant of Ingalls Iron Works that the union is prepared to cancel its contract. Action results from charges the Ingalls management was inspiring a movement to "combat the progress which CIO unions in particular, and trade unions in general in this vicinity, are making in the direction of fully co-operative relations with the employers with whom they have

collective bargaining contracts."

Reference is to the campaign SWOC has launched here toward closed shop and checkoff for all holders of its contracts.

In his letter to Ingalls, stating the union's objectives, Golden conceded he might have been mistaken as to Ingalls' intention, and asked that he be advised if such were the case. The current closed shop campaign has been partly successful in the Beaver valley. Philip Murray, SWOC chairman, recently stated the union's next objective is to install similar clauses in all contracts.

Employes of the NLRB attended a closed meeting of SWOC Lodge 1211 at Aliquippa, Pa., and distributed back-pay to 23 Jones & Laughlin employes discharged during friction between J. & L. and the union, but later reinstated. Company paid approximately $25,000; the union had demanded more than $50,000. In return, the latter has dropped charges filed with the labor board that J. & L. had interfered with organizing activities.

•

Unemployment Reduced

Statistics on unemployment in Pennsylvania have been compiled, showing 1,173,800 on relief. However, only 363,300 are listed as employable. Unemployment in Pennsylvania has decreased to a negligible point due to industrial recovery. Number of workers absorbed into industry has been matched by an almost equal amount thrown out of work through curtailment of WPA.

New High-Speed, Diesel Powered, Crawler Tractor Introduced by Allis-Chalmers

■ A NEW line of high-speed diesel crawler tractors powered by General Motors engines, has been announced by Allis-Chalmers Mfg. Co., Milwaukee. First of the new line, the HD14 now is available. Other models will be released shortly.

The HD14 develops 130 horsepower on the belt, 106 horsepower on drawbar, and weighs 27,000 pounds. Transmission with six forward speeds and two reverse provides forward speeds from 1.72 to 7 miles per hour, and reverse speeds of 2 and 3.2 miles per hour.

The two-cycle, six-cylinder engine is said to provide exceptional smoothness and performance. In testing this engine, Allis-Chalmers moved over 2,000,000 cubic yards of earth on two difficult construction projects, Rio Grande flood control system and the Pennsylvania Turnpike, in addition to logging jobs.

The engine also makes possible throttle control of a tractor, giving a range of speeds in any gear down to half the rated engine speed, without loss of drawbar pull.

Other features include the use of the new "Positive Seal" truck wheels, recently introduced by Allis-Chalmers, which require lubrication only once every 200 hours. New and revolutionary steering clutches and brakes of a bi-metallic material are used which are said to make a marked reduction in maintenance expense.

The HD14, illustrated below, is designed to handle the larger scrapers, 12 to 14-foot blade graders, bulldozers, trailbuilders, rippers, winches, logging arches, wagons, snow plows, and other auxiliary equipment.

Industrial News From Canada

TORONTO, ONT.

■ FIRST quarter bookings in Canadian iron and steel markets increased last week. Some mills have closed contracts covering virtually their entire production of certain products to April 1. Most of this business is for ordinary domestic needs; only a limited amount of steel has been ordered for war requirements.

Recently there have been heavier placements of war contracts for the Canadian and British governments although awards for shells, guns and general munitions have been comparatively small. Officials in Ottawa state more attention will be given shell and gun contracts immediately after Jan. 1.

The war purchasing board, Ottawa, will receive bids until Jan. 4 for 30 "whale catchers," anti-submarine craft, 190 feet long and costing approximately $400,000 equipped. Twenty will be for the Canadian government, 10 for Great Britain. These contracts will stimulate demand for plates as well as other forms of steel. It is understood that to obtain delivery in sufficient volume orders will be placed with American steel firms.

The British commonwealth air training plan, in which Canada, Great Britain, Australia and New Zealand will participate, was made public last week. Program calls for expenditure of $600,000,000 during the next three years. Canada's share will be $350,000,000. The agreement is to March 31, 1943, but may be extended or ended by mutual consent.

Prime Minister Mackenzie King stated "full speed ahead already has been ordered to establish Canada as one of the greatest air training centers of the world. With money

being spent on other services, Canada's war contribution for the first year is costing $1,000,000 a day."

Mr. King reported the plan requires 67 training centers in Canada, with nearly 40,000 men, exclusive of students. About 60 new air fields will be constructed and 20 existing fields enlarged. Three large ground schools, an unstated number of elementary flying schools, ten air observer schools, ten bombing and gunnery schools, two air navigation schools, four wireless training schools, and schools for instructors, ground crews and maintenance men are planned. First year's cost will be about $90,000,000, of which Canada will pay $45,000,000.

Will Use U. S. Planes

Lord Riverdale, head of the British air ministry, stated Britain would provide most of the training aircraft. Primary training in Canada will be on De Haviland Moths and Fleet ships, with advance instruction on North American Harvards, fast low wing monoplane built in United States. Service aircraft for advanced training will be sent from England, including the Fairey battle, and the twin-engined Avro Anson machine.

Lord Riverdale said 500 Harvard trainers, ordered in United States by Great Britain, are to be used in Canada. Britain's original order for Harvards totaled 400 planes, of which 325 have been delivered. The remaining 75 are to be delivered to the Royal Canadian air force in addition to Britain's second order for approximately the same number as the first. Canada has purchased 30 Harvards, most of which have been delivered by the "push-and-pull" method over the border.

It is estimated more than 5000 airplanes will be required by Canada alone. Other large orders by Britain and Canada are expected to be placed soon, chiefly with United States firms, although Dominion plants will receive sufficient orders to maintain capacity operations for some years.

Further war orders valued at $5,638,000 were placed by the purchasing board during the week, according to Transport Minister Howe. Canada's total purchases since Sept. 1 are $54,000,000. Largest orders, for airplane supplies and accessories, $3,392,000. Most of these were placed with the British air ministry. Orders in excess of $1,033,000 were placed for defense stores and $456,000 for equipment for the Canadian fighting forces. Ontario and Quebec firms received the bulk of the awards.

In preparing to ship 11,900 tons of copper as its quota of the British government's order for 210,000 tons, placed several weeks ago and to be delivered over the coming year, Waite Amulet Mines Ltd., controlled by Noranda Mines Ltd., in Duprat township, Quebec, has placed the last unit of its new mill in operation. It now is treating about 700 tons of ore daily.

Car loadings in Canada for the week ended Dec. 9 totaled 50,390, a decrease of 4725 cars from the previous week, but an increase of 7222 over the corresponding week a year ago.

"First All-Welded Hull for the Navy"

■ **This hull for the 25-ton floating crane is reported to be the first all-welded hull ever purchased by the navy department. Built at Dravo Corp.'s Neville Island (Pittsburgh) shops and assembled and launched at its Wilmington, Del., yards, the crane will go into service at the Norfolk navy yard. A duplicate crane will be shipped to the West coast, assembled there for service at the Mare Island navy yard**

British Institute Pays Tribute to Schwab

■ British Iron and Steel institute did not hold its autumn meeting this year because of the war. Instead, a statutory meeting was held at 4 Grosvenor Gardens, Nov. 23. At the opening, members stood in silence in memory of Charles M. Schwab, the American steel leader who died Sept. 18. James Henderson, vice president, in absence of the president, Lord Dudley, presided.

It was announced John Craig, vice president of the institute, and chairman and managing director of Volvilles Ltd., Glasgow, had accepted the council's invitation to become president of the institute for two years as of the annual meeting of 1940.

Owing to the war the autumn meeting of the British Institute of Metals was postponed. A business meeting was held, however, at which nominations were made to fill vacancies occurring on the council next year.

Lieut.-Col. the Hon. R. M. Preston, D. S. O., managing director, Rio Tinto Co. Ltd., was nominated for the presidency. Those chosen for vice presidents were Dr. S. F. Dorey, chief engineer surveyor, Lloyds Register of Shipping, Engineer Vice Admiral Sir George Preece, K. C. B., engineer in chief of the fleet, and A. J. G. Smout, chairman of metal group companies of Imperial Chemical Industries Ltd.

Idlers for 9.6-Mile Conveyor Belt Awarded

■ Chain Belt Co., Milwaukee, has been awarded the contract by Columbia Construction Co., Redding, Calif., to furnish the belt conveyor idlers for the longest belt conveyor system ever installed. This 9.6 mile belt conveyor (STEEL, Dec. 4, 1939) will handle the aggregate for construction of Shasta dam, being built by the United States department of reclamation for irrigation purposes in the Central valley, California.

Over 16,000 troughing and return belt idlers will be used in making up this transportation system. In manufacturing the idlers, Chain Belt will use about 18 miles of steel tubing, 11 miles of steel shafting, 10½ miles of angle iron, 50,500 malleable castings and 83,000 antifriction roller bearings.

LABOR

TIME EXTENSION GRANTED IN WALSH-HEALEY CASE

■ SMALL eastern steel companies opposing the minimum steel wage determination under the Walsh-Healey act have been granted an extension of time to file answer to the labor department's petition to the Supreme Court for review of the appellate court's decision (STEEL, Dec. 18, p. 28). Originally set for Jan. 4, date for filing answer has been advanced to Jan. 23.

G. E. PAYS EMPLOYE FOR NEW GAGE SUGGESTION

Suggestions of a routine method for gaging marble-size bearings to split-hair accuracy solved the Christmas shopping problem for Russell Goulty, General Electric Co., Schenectady, N. Y., factory worker. Mr. Goulty, a mechanical inspector received a $500 check from the plant's suggestion committee for his ingenious idea.

He developed a method of inspecting ball bearings used in selsyns. Delicate synchronization in selsyns necessitates minute accuracy in their bearings. Previously there had been no simple method of gaging component parts of the bearings. The suggested device is small enough to be held in the hand and so simple it does not require an experienced operator. It readily detects variations 1/30 the thickness of a human hair.

General Electric's suggestion system has won employes more than $1,000,000 for 75,000 suggestions adopted in the 20 years of its existence.

WESTINGHOUSE ADJUSTED COMPENSATION 10 PER CENT

Adjusted compensation of 10 per cent will be paid all employes of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., this month, in accordance with its wage and salary plan. The amount is established each month in proportion to net earnings in the preceding three months.

Net income the last three months was $4,290,094; $1,104,137 in September; $1,363,840 in October; and $1,822,117 in November. Last month adjusted compensation was 6 per cent.

Approximately 46,500 employes will receive this month's extra compensation in the company's 57 manufacturing and service plants throughout the country and in all sales and service offices.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Dec. 23	Change	Same week 1938	Same week 1937
Pittsburgh	91	— 2	40	14
Chicago	92	—0.5	56.5	23.5
Eastern Pa.	85	— 3	32	25
Youngstown	91	— 2	45	18
Wheeling	85	None	59	19
Cleveland	87.5	—2.5	50	24
Buffalo	79.5	—10.5	44	14
Birmingham	94	None	82	45
New England	89	— 4	70	28
Cincinnati	82	+ 13	75	36
St. Louis	77	— 8	51.5	15
Detroit	90	— 4	90	52
Average	90.5	— 2	52	23

Midvale Co. Expanding Philadelphia Plant

■ An extensive improvement and expansion program of Midvale Co., controlled by Baldwin Locomotive Works, now underway is creating large-scale re-employment in the company's Philadelphia plant and in mills of supply companies, according to Dr. Harry L. Frevert, president. Midvale Co. had 3277 employes Dec. 1, compared with 2333 Dec. 1, 1938.

Sam Makes 'Em Tidy Up

■ "Sloppy Sam" is the brainchild of the plant inspection committee in the Buffalo steel-service plant of Joseph T. Ryerson & Son Inc. Sam is given lodging in departments proclaimed substandard by the committee during weekly inspection tours. His visits evoke chiding from members of other departments, who in turn make an effort to keep their departments clean so he will have no reason to call on them.

The results of this humorous approach to the cleanliness problem, coupled with safety and efficiency, were so favorable that duplicates of Sam were made for the company's other plants. The figures are flame-cut from rolled steel plate and painted in bizarre colors.

PRODUCTION

SEASONAL FACTORS LOWER RATE TO 90.5 PER CENT

■ STEELWORKS operations last week declined 2 points to 90.5 per cent, furnace repairs and deferred shipments being principal factors. This week holiday shutdowns will bring a further reduction. Nine districts were at lower rates, one at a higher and two were unchanged. A year ago the rate was 52 per cent; two years ago 23 per cent.

Youngstown, O.—Two points lower at 91 per cent, with 67 open hearths and three bessemers active. Republic Steel Corp. will shut down tin mills at Warren, O., until after New Years, other finishing mills resuming Tuesday.

St. Louis—Two interests each took off one open hearth for repairs, reducing the rate down 8 points to 77 per cent. Both will resume production this week.

Chicago—Down ½-point to 92 per cent on small curtailment by two producers, another increasing output slightly.

Birmingham, Ala.—Unchanged at 94 per cent, 22 open hearths producing.

Detroit—Off 4 points to 90 per cent, 22 open hearths being on all week and two others a few days.

Cleveland—Declined 2.5 points to 87.5 per cent.

Cincinnati—Rose 13 points to 82 per cent, following shutdowns of a number of furnaces for equipment repairs and installations.

Pittsburgh—Dropped 2 points to 91 per cent. Holiday shutdowns this week will cut output heavily.

Wheeling—Steady at 85 per cent. A rate of about 60 per cent is indicated for this week.

Central eastern seaboard — Receded 3 points to 85 per cent.

New England—Off 4 points to 89 per cent.

Buffalo—Down 10½ points to 79½ per cent, four open hearths undergoing repairs.

Foundry Equipment Order Backlog Grows

■ Foundry equipment orders, shipments and unfilled orders in November, reported by Foundry Equipment Manufacturers' association, Cleveland, showed some recession in orders but backlogs increased considerably. Comparisons follow, indexes based on 1922-24:

	Nov. 1939	Oct. 1939	Nov. 1938
Net orders	192.2	220.4	89.7
Shipments	170.1	170.7	94.5
Unfilled orders	246.9	224.7	87.0
3 mos. av. gross orders	199.2	178.9	85.4

MEN OF INDUSTRY

■ ALEXANDER L. FEILD has been appointed director of chemical research, Rustless Iron & Steel Corp., Baltimore. He will remain in charge of patent activities and continue as consulting metallurgist for the Rustless corporation with which he has been associated since 1931. Prior to that he was research engineer and melting superintendent for Simonds Saw & Steel Co., Lockport, N. Y., and has been associated in metallurgical research with United States bureau of mines, Union Carbide & Carbon Corp., and Central Alloy Steel Corp.

E. P. Geary has been named assistant vice president in charge of sales for Rustless. He recently returned from England where he was assistant managing director of British Stainless Steel Ltd. Formerly he was midwestern sales manager of Rustless, with headquarters in Chicago. For 13 years Mr. Geary was associated with Vanadium Alloys Steel Co. and Colonial Steel Co. in various capacities in the production, metallurgical and sales divisions.

♦

Henry R. Fox, Chicago, has been appointed general field engineer for Despatch Oven Co., Minneapolis.

♦

William F. Luria, son of the late Max Luria, has been elected treasurer, Luria Bros. & Co. Inc., with headquarters at Philadelphia. He formerly was assistant treasurer.

♦

W. H. Blackmer, Larchmont, N. Y., has been made sales engineer in the New England and metropolitan New York area for the John S. Barnes Corp., Rockford, Ill.

♦

C. Grindrot has been named sales engineer, Wyckoff Drawn Steel Co., Pittsburgh, with headquarters at the company's Chicago office, 3201 South Kedzie avenue.

♦

Robert F. Treuer has been named manager, Los Angeles office, Federated Metals division of American Smelting & Refining Co., with offices at 4010 East Twenty-sixth street.

♦

James Emmet Gleason, president, Gleason Works, Rochester, N. Y., has been awarded the American Society of Mechanical Engineers' gold medal for 1939, for his "technical and engineering contributions and his distinguished service to the automotive industry by making possible better and safer gear drives."

♦

Donald S. Beal, previously service engineer in the Chicago territory for Porcelain Enamel & Mfg. Co., Baltimore, has been promoted to sales representative in that area.

♦

Robert A. Jones has been appointed district engineer, New York district, General Electric Co., Schenectady, N. Y., effective Jan. 1. W. S. Hill has been named assistant district engineer. Assistant engineer of the New York district since Dec. 1, 1938, Mr. Jones has been associated with the firm since graduation from the University of Minnesota in 1916. Mr. Hill has been with the company 16 years, and since 1928 has been in the New York engineering department.

Alexander L. Feild

♦

Omer L. Allen, formerly superintendent, Wilson Foundry & Machine Co., Pontiac, Mich., has been named superintendent, foundry department, Pontiac Motor division of General Motors Corp.

♦

Thomas M. Purtell has been made district manager of sales in the Connecticut territory for Wyckoff Drawn Steel Co., Pittsburgh, with headquarters at 125 Trumbull street, Hartford, Conn.

♦

C. Swain Lumley has been named district engineer, Roller-Smith Co., Bethlehem, Pa., maker of electrical measuring and protective apparatus, with headquarters at 53 West Jackson boulevard, Chicago. Mr. Lumley, the past three years was electrical engineer in charge of design for Detroit's new sewage disposal project.

♦

Jerome Strauss, vice president, Vanadium Corp. of America, New York, has been elected a member of the board of directors, American Standards association, succeeding Dr. G. W. Thompson, resigned.

♦

Henry G. Dalton, senior partner of Pickands, Mather & Co., Cleveland, and chairman of the board, Youngstown Sheet & Tube Co., Youngstown, O., is seriously ill in Lakeside hospital, Cleveland, following an emergency operation for acute appendicitis.

♦

I. N. Kimsey has been named manager, and R. A. Charlton, assistant manager, Akron sales division, B. F. Goodrich Co., Akron, O. J. S. Gulledge has been made manager of the St. Louis district, and A. M. Fiala, product sales manager, Air-Cell division.

♦

D. F. McCandlish, the past four years manager, Oklahoma City, Okla., district for Air Reduction Sales Co., New York, has been appointed manager of the Detroit district.

G. J. Dekker, formerly assistant manager, Detroit district, for Air Reduction, succeeds Mr. McCandlish as manager at Oklahoma City. He has been associated with the company over 20 years.

♦

William B. Pollock II, president, William B. Pollock Co., has been elected to a three-year term as a director of the Youngstown, O., chamber of commerce, while William B. Gillies, vice president, Youngstown Sheet & Tube Co., and R. L. Leventry, district manager, Republic Steel Corp., have been re-elected for three-year terms in the industrial division of the chamber's directors.

♦

Philip Torchio, retired vice president, Consolidated Edison Co., New York, has been awarded the 1939 Edison medal of the American Institute of Electrical Engineers, for "distinguished contributions to the art of central station engineering and for achievement in the production, distribution, and utilization of electrical energy." Presentation will be made Jan. 24 during the winter convention of the institute.

♦

Honorary memberships in the American Society of Mechanical Engineers have been conferred upon Dexter Kimball, dean-emeritus of the college of engineering, Cornell university, Ithaca, N. Y.; Edwin Jay Prindle, retired patent attorney and mechanical engineer, East Orange, N. J.; Charles T. Main, industrial

engineer and expert on power and textile plants, Boston, and Henry Hague Vaughan, consulting engineer and president, Canadian Foreign Investment Corp., Montreal, Que.

DIED:

■ WILLIAM U. FOLLANSBEE, chairman of the board, Follansbee Bros. Co., sheet, tin and terne plate maker, in Pittsburgh, Dec. 19. Mr. Follansbee was born in Pittsburgh, Dec. 23, 1859, and after graduating from high school, went to work as a bookkeeper at Rosedale foundry. Later he obtained a position with James B. Scott & Co., importer of Welsh tin plate.

In 1884, with his brother, the late B. G. Follansbee, he organized Follansbee Bros. Co., and in 1902-04 this company built a sheet mill at Follansbee, W. Va. In 1905 it installed three 40-ton open-hearth furnaces. Later a tin and terne plate department was added with annual capacity for producing 250,000 boxes of tin plate and 90,000 tons of ingots. In 1919-22 the company built similar works at Toronto, O., with four 40-ton open-hearth furnaces, producing yearly 84,000 tons of black sheets. John Follansbee has been president, and M. A. Follansbee, general sales manager. In recent years the company has been working out from under a trusteeship and is being reorganized.

♦

James Glover, sales representative, Scullin Steel Co., St. Louis, in St. Louis, Dec. 11.

♦

Peter A. Dignam, 76, president, Lamson Cutter Head Co., Chicago, Dec. 17 in Chicago.

♦

Walter A. Scherff, 56, founder and president, Scherff Machine Co., Milwaukee, in that city Dec. 9.

♦

William B. Whitmore, 50, president, Universal Castings Corp., Chicago, in Chicago, Dec. 14.

♦

Herbert H. Macomber, 67, the past 23 years president of Flint & Walling Mfg. Co., Kendallville, Ind., in that city, Dec. 7.

♦

William W. Hearne, 81, well known ore merchant, at his home in Philadelphia, Dec. 18. F. W. Marshall & Co., Philadelphia, with which he had been associated the past ten years, will assume his business activities.

♦

J. W. Townsend, 84, retired vice president of the former Cambria Steel Co., now a part of Bethlehem Steel Co., at his home in Bryn Mawr, Pa., Dec. 5. Born in Philadelphia, Mr. Townsend was graduated from the University of Pennsylvania in 1875 and was active in the steel industry many years.

♦

William M. Brobeck, 95, first man to be pensioned by Jones & Laughlin Steel Corp., Pittsburgh, Dec. 7 at his home in Youngstown, O. He had been with the company 42 years, retiring in 1908 from the position of superintendent of the cold rolling mills and machine shop.

♦

Henry H. Howell, 55, at Birmingham, Ala., Dec. 15. He joined Tennessee Coal, Iron & Railroad Co. in 1901 as office boy, and advanced through various positions until he was made tax agent of the company's land department, which office he held at time of his death.

♦

John D. Jones, 60, sales manager, Detroit division of the alloy department, Youngstown Sheet & Tube Co., Dec. 13 while on a business trip to Toledo, O. He was the brother of the late Harry R. Jones, former president, United Alloy Steel Co., Canton, O., and later one of the projectors of Sheet & Tube's alloy division.

♦

Richard C. Bourne, 57, a director, Enamel Products Co., Cleveland, Dec. 15 in that city. Mr. Bourne was associated with Bourne-Fuller Co., until its absorption by Republic Steel Corp. in 1928. He was also with Williamsport Wire Rope Co. until ill health forced his retirement several years ago.

♦

Alfred J. Kroenke, 66, chairman of the board, Geometric Stamping Co., Cleveland, Dec. 16 at his home in Lakewood, O. His early business associations were with Cleveland Chaplet & Mfg. Co. and F. Hohlfelder Co., foundry supply manufacturers. From 1927 to 1933 he was president, Van Dorn Iron Works Co. In 1934 he became general manager and director of Geometric, and shortly thereafter was elected chairman.

♦

Don P. O'Keefe, 57, general purchasing agent, Chevrolet division, General Motors Corp., Detroit, in that city, Dec. 18. He had been with General Motors many years, joining Buick Motors Co. in 1906. Two years later he was made purchasing agent of Buick, and in 1926 went to New York as purchasing agent for Chevrolet. When the company's main offices were transferred to Detroit a few years later he accompanied them.

Activities of Steel Users, Makers

■ MICROMATIC Hone Corp., Detroit, manufacturer of honing machine tools, has leased additional space at 1349 East Milwaukee street, practically doubling space formerly occupied. Further additions of machinery have increased substantially the extent of production capacity. New office space has been occupied at 1351 East Milwaukee, in which are located purchasing, factory superintendent, export sales and advertising offices. The company will close the current year with the greatest backlog of unfilled orders in its history, according to Kirke W. Connor, president.

♦

Peninsular Steel Co., 1468 Lakeside avenue, Cleveland, has purchased land for a new warehouse, construction of which has already begun. The new 1-story building, 85 x 120 feet, will cost about $28,000. Completion is scheduled for Feb. 1.

♦

Jones & Laughlin Steel Corp., Pittsburgh, will move its New York office from 500 Fifth avenue to larger quarters on the twenty-fourth floor of the New York Central building, 230 Park avenue, Jan. 1. W. R. Breeze is district manager.

♦

Joseph T. Ryerson & Son Inc., Chicago, has been appointed distributor of McKay certified stainless steel electrodes. All Ryerson branches, including Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City as well as the central plant in Chicago, will carry stocks of these electrodes.

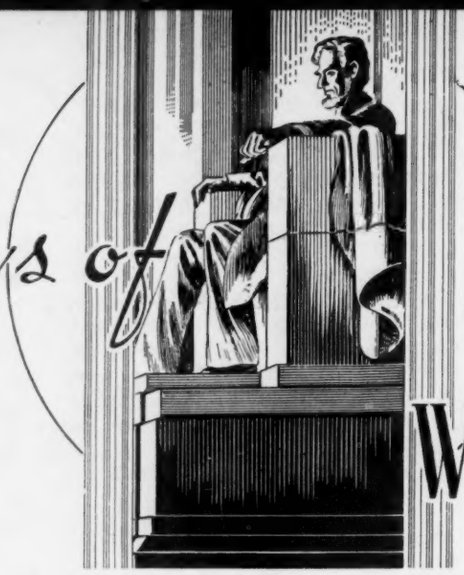
♦

Lift Trucks Inc., Cincinnati, has been organized by Walter C. Stuebing, president, and his brother, William R. Stuebing, vice president, to manufacture electrically-powered trucks for industrial use. Trucks are now being made by the Stuebing Automatic Machine Co., Cincinnati, but a new plant is planned.

♦

American Chain & Cable Co. Inc., Bridgeport, Conn., recently put into operation a modern manufacturing plant and warehouse at Houston, Tex., to improve its service to the oil industry and other users of its products in the southwest. In addition to wire rope which will be manufactured and warehoused there, other products which will be carried in stock are Reading-Pratt & Cady valves, Manley service station equipment, Wright hand-operated and electrically-operated hoists, and Ford chain hoists and trolleys.

Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ JOHN W. HANES, under secretary of treasury, has resigned and the President has accepted the resignation effective Dec. 31.

Mr. Hanes was held in high esteem by businessmen, who felt that he, more than most administration members, understood business' problems. It was Mr. Hanes who invited businessmen to present their views on tax reform and who analyzed and presented these views to the congressional subcommittee considering revamping the tax structure.

CIO SCOFFS AT REPORTS OF SKILLED LABOR SHORTAGE

Skilled labor shortage reports were denied last week by the Congress of Industrial Organizations. The union holding company insists there are plenty of unemployed who want jobs but can't get them, and that all this talk of labor shortage is "wishful thinking of those who want to believe that the nation does not have to provide for its unemployment."

"There is no shortage of labor," and there "cannot be a shortage of labor for a long time," the CIO said, warning that "our national economy will be in danger if the propaganda of a shortage of labor is successful in fooling the nation to the belief that unemployment is wiped out."

CIO points out that there are 9,500,000 unemployed who want jobs but cannot get them, that 5,500,000 are registered in United States employment service lists, admittedly incomplete, and that close to 1929 production levels are being reached with fewer workers employed.

JONES GETS NEW POST IN COMMERCE BUREAU

Grosvenor Jones, chief of the finance division, bureau of foreign and domestic commerce, has been appointed assistant to Director James W. Young, in charge of the international divisions.

In his newly-created post, Jones will administer the divisions of commercial laws, finance, foreign service liaison, foreign tariffs, regional information and the trade agreements unit.

The regional information division is the clearing house for all information concerning the economies of other countries and international economics; the finance division analyzes and disseminates information on foreign exchange, currency, loans and investments, insurance and capital movements, and compiles balance of payment figures.

The foreign service liaison acts as co-ordinator of the foreign trade activities of the state and commerce departments; the foreign tariffs division analyzes tariffs, import and export restrictions of other nations; the trade agreements unit participates in the formulation and negotiation of all trade agreements.

The commercial laws division keeps American foreign traders posted on late developments in legislation and decrees effected by all countries' that concern commerce, operates a world-wide trade adjustment service and trademark piracy service, and handles the interests of the American insurance business abroad.

At the same time, Amos Taylor, assistant chief of the finance division, was appointed to succeed Jones as chief of the division. Taylor is well known as an authority on studies of balance of payments. The elevation of Jones to his new post is one of the series of moves underway in the reorganization of the bureau.

GERMANY INCREASES SALES ACTIVITY IN BELGIUM

Belgian concerns engaged in the import of machinery say German firms are increasing rather than decreasing their sales activities in Belgium, according to a report from the assistant trade commissioner in Brussels. Low quotations and quick delivery on German machinery are resulting in serious competition for imports from other countries, including the United States, and although machinery sales began to show an upward tendency in early November, much of the increased business was reported going to Germany.

German promises of quick delivery are supported by shipment of machinery at present which had been promised for 1940. A typical example of this has been the supplying at the end of October of a large machinery order to a Belgian firm for shipment to the Congo. The shipment had been ordered in March 1939 and delivery promised for June 1940. Another indication of increased sales efforts on the part of German manufacturers is that while additional discounts are offered for cash, long-payment terms are reported to be readily granted. Before the outbreak of war, German suppliers had been reported reluctant to grant long-term credit.

BRITAIN ESTABLISHES IMPORT LICENSE SYSTEM

An order issued by the British board of trade, effective Dec. 18, establishes a uniform system of advance licenses for importation into the United Kingdom of all iron and steel products. Included are alloy steels (formerly admissible under quota at 10 per cent, which were exempted from import duty on Dec. 5), and a wide variety of iron and steel products and materials used in their manufacture which had not hitherto been subject to quantitative control.

Iron and steel products formerly subject to quota at 10 per cent ad valorem which are now duty free

Speed Nuts

REDUCE ASSEMBLY COSTS 50%

PREVENTS LOOSENING FROM VIBRATION

OLD WAY

Speed Nut System (PATENTED)

Replaces Threaded Nuts and Lock Washers

SPEED NUTS are manufactured from high carbon spring steel and heat treated to provide positive holding power for the life of the product. Made for most standard sizes of machine screws, stove bolts, metal screws, metal rivets and plastic studs. Many special shapes and sizes also developed for mass production products. Write for samples today, stating sizes desired and nature of application.

SPEED NUT DIVISION TINNERMAN STOVE & RANGE CO.
2039 FULTON ROAD, CLEVELAND, OHIO
Manufacturers of Patented SPEED NUTS
In Canada, Wallace Barnes Co., Ltd., Hamilton, Ontario. In England, Simmonds Aerocessories, Ltd., London

but subject to import license are: Pig iron; ingots; blooms, billets, and slabs; girders, beams, joints, and pillars, whether fabricated or not; angles, shapes, and sections, whether fabricated or not; colliery arches and pit props; bars and rods; plates and sheets; hoop and strip not already duty free; railway and tramway rails; wire (including barbed wire) and wire cable and rope; upholstery and mattress wire springs; and screws for wood, whether coated or plated or not.

Railway Equipment Included

Additional iron and steel products and materials used in the manufacture of iron and steel, whether intended for such use or not, and hitherto not subject to quantitative control, which become subject to import license, are: Iron ore, concentrates and residues, whether briquetted or not; iron and steel scrap and waste; ships imported for the purpose of being broken up; manganese, molybdenum, tungsten, and vanadium ores, concentrates, and residues; niobium (columbium) ores and tantalum ores; cemented carbide metal; molybdenum, niobium (columbian), tantalum, tungsten, and vanadium metal; calcium silicide; titanium carbide; molybdenum, tantalum, tungsten, and vanadium compounds; ferroalloys of all kinds, whether briquetted or not; silicon in all forms, silicon alloys, whether briquetted or not.

Railway and tramway construction material; Sleepers, tie rods, tie bars, fish plates, sole plates and continuous joint plates.

Railway and tramway rolling stock: Wheels, tires, axles, and buffers, whether assembled or not; tubes, pipes, and tube and pipe fittings (not including radiators, cased parts).

Wire netting, wire fencing, and wire mesh; nails, tacks, and staples (excluding insulated staples), hobnails, studs, and spikes; rivets, and washers; bolts and nuts, bolt ends; coach screws, screw studs, and other screws for metal.

Application for licenses for iron and manganese ores; concentrates, and residues must be made by British importers to the director of foreign ores, iron and steel control, 24 Old Broad street, London, E.C. 2, a separate license being required for each consignment before shipment. Applications for licenses for all other materials or products should be made to the iron and steel control, Tothill street, London, S.W. 1, a separate license being required for each class of goods and separate applications being recommended for each transaction. Licenses will be issued in each case by the import licensing department of the board of trade on approval by the iron and steel control.

The usual exemption is provided for shipments dispatched from the foreign point of origin to the United Kingdom before Dec. 18.

SWEDEN CONSIDERS IRON, STEEL PRICE REGULATION

Regulation of iron and steel prices by a control board working with the government is under consideration in Sweden, according to a report from F. A. M. Alfsen, Stockholm. Proposed organization would be similar to pooling arrangement, the pool buying the output of Swedish mills at prices covering overhead plus a reasonable profit. The pool would also take over imported iron and steel and sell to consumers at an average price appreciably under that now being paid for imported products.

Another suggested plan is that Swedish iron mills transfer part of their profits to the pool to compensate for losses suffered by selling imported iron below cost.

Considerable opposition to the pooling program has arisen, particularly from the mill at Domnarfvet, which with a large output and integrated production methods, is in a position to compete with the International Steel Cartel. It has been Domnarfvet's independent position which has enabled Sweden up to now to remain outside the cartel.

BIDS ON MANGANESE ORE RECEIVED BY TREASURY

Procurement division, treasury department, has received the following domestic bids for manganese ore under the strategic minerals law: Greenbrier Mining Corp., White Sulphur Springs, W. Va., 10,000 tons at 75 cents per unit; John E. Harris, Salt Lake City, Utah, and Neils Pallesen, Manilla, Utah, 2000 tons at 65 cents per unit; Luna Manganese Co., Jackson, Mich., 7500 tons minimum at 80 cents at mine and 7500 tons minimum at 80 cents at mine; L. L. Patrick, Los Angeles, 5000 tons at 62 cents per unit; Oliver & Co. Inc., Cleveland, 45,000 tons at $50 per ton, 45,000 tons at $47.50 per ton, and 45,000 tons at $45 per ton; The Domestic & Foreign Commerce Corp., Washington, 2000 tons at 60 cents per unit, 2000 tons at 55 cents per unit, and 2000 tons at 50 cents per unit; Great Valley Manganese Co. Inc., Stuarts Draft, Va., 5000 tons at 75 cents per unit; and North American Manganese Corp., St. Louis, 5000 tons or more at 70 cents per unit.

A tariff of ½-cent per pound must be added to the price of the foreign bidders. The foreign bidders are: W. R. Grace & Company, New York, 2000 tons at 48.5 cents per unit; William H. Muller & Co. Inc., New York, 5000 tons at 47.95 cents per unit; Rosslyn Manganese Corp., Washington, 5000 tons at 62 cents per unit, 5000 tons at 61 cents per unit; and 5000 tons at 60 cents per unit; Tonerde Inc. and Derivatives Inc., New York, 7000-8000 tons (one cargo each) at 56 cents per unit, 7000-8000 tons (one cargo each) 77.48 cents per unit, and 7000-8000 tons (one cargo each) at 79.93 cents per unit; and Commercial Engineering Co. Inc., Washington, 45,000 tons at 60 cents per unit.

GOVERNMENT IRON STEEL AWARDS TOTAL $1,441,448

During the week ended Dec. 9, the government purchased $1,441,448.19 worth of iron and steel products under the Walsh-Healey act as follows: Edge Moor Iron Works Inc., Edge Moor, Del., $127,100; Wickwire Brothers, Cortland, N. Y., $9200 (estimated); American Chain & Cable Co. Inc., American Cable Division, Wilkes-Barre, Pa., $29,775.35; the Eastern Rolling Mill Co., Baltimore, $57,205.37; Boiler Tank & Pipe Co., Oakland, Calif., $15,680; Allis-Chalmers Mfg. Co., Milwaukee, $47,826; Messinger Bearings Inc., Philadelphia, $74,623; Albert & Davidson Pipe Corp., Brooklyn, N. Y., $44,534.01; Titeflex Metal Hose Co., Newark, N. J., $16,254; United States Pipe & Foundry Co., Philadelphia, $42,785; Belmont Iron Works, Philadelphia, $30,153; Central Iron & Steel Co., Harrisburg, Pa., $10,049.16; Construction Supplies Co. of America, New York, $10,660; United States Pipe & Foundry Co., New York, $17,617.65; Noland Co. Inc., Washington, $11,325.10; National Electric Products Corp., Pittsburgh, $77,070; Industries Supply Co., San Diego, Calif., $12,115.12; Bethlehem Steel Co., Bethlehem, Pa., $27,606; Virginia Machinery & Well Co. Inc., Richmond, Va., $10,065.89; Budd Wheel Co., Detroit, $375,996.60; the American Rolling Mill Co., Middletown, O., $13,200; Treadwell Construction Co., Midland, Pa., $320,000; J. M. Tull Metal & Supply Co. Inc., Atlanta, Ga., $11,037; the Kline Manufacturing Co., Columbus, O., $30,142.50; and Pennsylvania Forge Corp., Philadelphia, $19,427.44.

ARGENTINA RELAXES TIN IMPORT RESTRICTIONS

Argentine exchange control office has relaxed exchange restrictions applying to imports of tin plate, according to the American consul general at Buenos Aires.

Prior exchange permits will be issued for import of tin from the United States during the second quarter of 1940 up to 50 per cent of the imports from all countries in the second quarter of 1939.

AVIATION

ARMY AND NAVY SEEK MORE FUNDS FOR AIRCRAFT

■ *LAST WEEK* the navy asked congress for $28,596,000 for 518 additional planes, and the army asked for $4,000,000 toward cost of five giant bombers, double the size of the present flying fortresses.

Action of the navy is due to efforts to increase the neutrality patrol and bolster a training program. Request was contained in a $271,000,000 deficiency bill sent to congress by President Roosevelt. These planes would bring the navy construction plans ahead of schedule. Present program calls for 3000 planes by 1944. If the additional aircraft are purchased, it is estimated the navy will have 2940 by end of 1940.

Details concerning the larger army flying fortresses have been kept secret. However, it is reported these ships will weigh approximately 70,000 pounds, and will be powered by four 2000-horsepower motors. Design of bombers will permit a cruising range of 5600 miles without load.

At the army air corps' laboratory, Wright Field, Dayton, O., construction is underway for a wind tunnel which will create a 400-mile per hour air blast, to test aircraft models. Heated by friction, air will be refrigerated mechanically, incidentally providing a means for studying the problem of combating ice formation.

The navy last week awarded Consolidated Aircraft Corp., San Diego, Calif., a contract for planes totaling $20,016,699. An order for airplane engines and propellers aggregating $9,220,919 went to United Aircraft Corp., East Hartford, Conn., and one for about $163,961 to Curtiss Propellor division, Curtiss-Wright Corp., Clifton, N. J., for propeller assemblies.

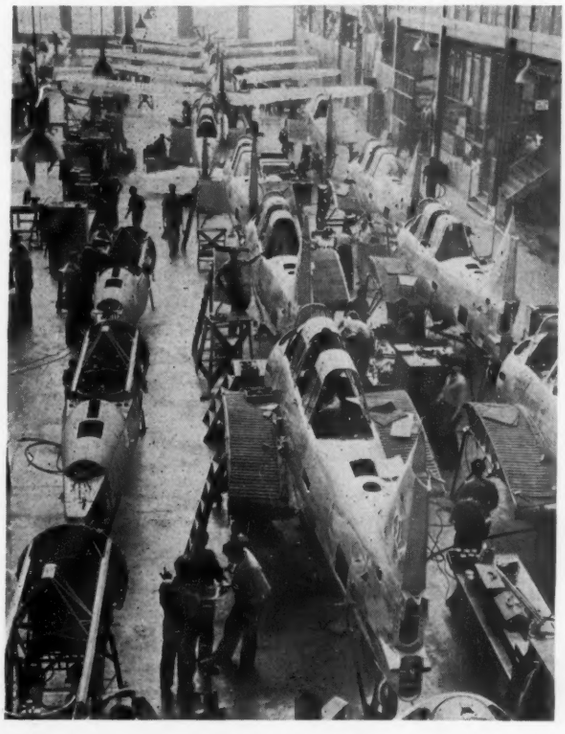
Since its invasion, Finland has been combing this country for military ships but has been unsuccessful because of accumulated orders. The navy diverted to Finland the remainder of 54 planes it had originally ordered from Brewster Aeronautical Corp., Long Island City, N. Y. The navy, however, will take delivery of improved planes of the same type at a later date.

Increases Backlog

Including the $550,000 order from the Chinese government for delivery of STM training jobs, Ryan Aeronautical Co., San Diego, Calif., officially placed its backlog at $1,500,000. Vultee Aircraft Inc., Downey, Calif., filed a registration statement with SEC covering proposed sale of 300,000 shares of capital stock at $10 per share.

According to a report by Air Transportation Association of America, 16 domestic air lines in November flew 60,610,808 revenue pasenger miles, against 70,221,520 in October, best previous month. Total for the first 11 months of 1939 was 612,301,467 revenue miles, compared with 438,696,972 in the like 1938 period, an increase of 39.57 per cent.

One of the most powerful air motors yet certified for commercial purposes in this country was approved by the Civil Aeronautics Authority recently. The motor, an 18-cylinder, air-cooled, 2000 horsepower unit, is manufactured by Wright Aeronautical Corp.



■ **General view of an assembly line at the plant of North American Aviation Co., Inglewood, Calif., where military aircraft for the United States are now under construction. Illustration shows army planes of the O-47-B type. NEA photo**

Unemployment Declines Third Successive Month

■ Unemployment in the United States continued to decline for the third consecutive month in October and reached the lowest level since November, 1937, according to the National Industrial Conference board, New York.

The October estimate of 8,149,000 jobless is 47,000, or six-tenths of 1 per cent below the revised September estimate, and more than 1,000,000 less than the figure for October, 1938.

Total employment rose slightly to 46,446,000, compared with 46,342,000 in September. This is the highest figure since October, 1937. A gain of 461,000 in industrial employment was largely offset by a seasonal decline of 447,000 in agriculture. Number employed in manufacturing rose to 10,864,000 from revised September estimate of 10,449,000, an increase of 415,000.

Line Production Feature Of Transformer Plant

■ Completion of a modern distribution transformer plant was announced recently by William Watson, vice president, Allis-Chalmers Mfg. Co., Milwaukee.

The new plant is an addition to the company's transformer factory, Pittsburgh, to be known as the River plant of the Pittsburgh Works. It is laid out and set up for modern line-production operation throughout. Raw materials start at one end, and at the other end the transformer comes off the line not only completed, but fully tested and boxed, ready for shipment.

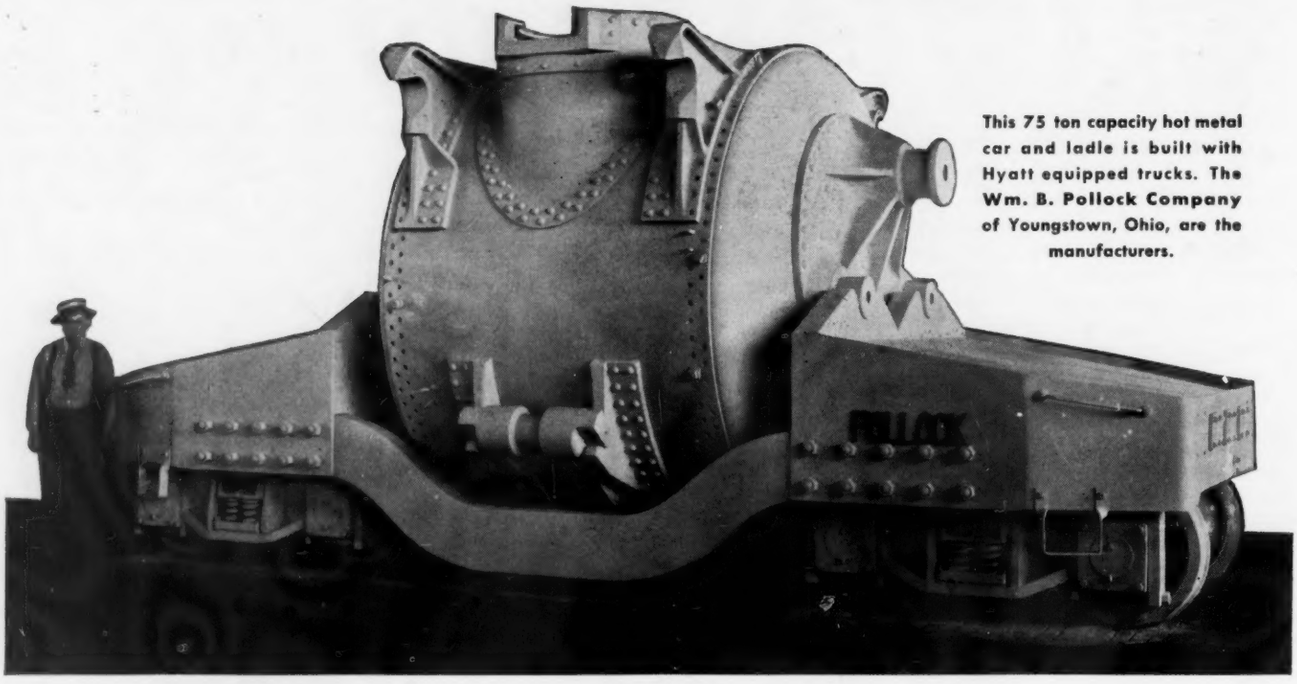
"Complete equipment," said Mr. Watson, "has been installed for testing transformers by means of artificial lightning up to a million volts in intensity. Also installed is a large bonderizing unit for protective treatment of transformer tanks, and a battery of automatic seam welders."

The addition was designed by the building engineering department of the company under its achitect, Carl Meyer.

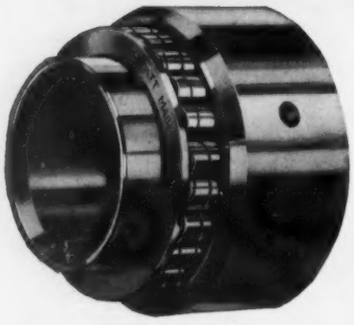
■ The steel industry ranks among the leading six out of 90 manufacturing industries of the nation in average hourly wages, according to American Iron and Steel institute.

Hyatt Mettle for Hot Metal

...or any other tough job!



This 75 ton capacity hot metal car and ladle is built with Hyatt equipped trucks. The Wm. B. Pollock Company of Youngstown, Ohio, are the manufacturers.



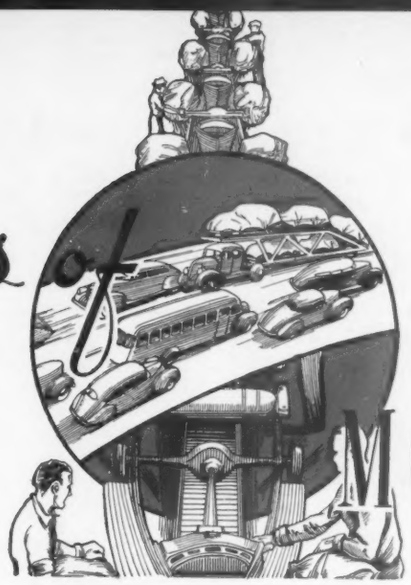
To stand up under the punishing shocks and heat of metal car service, bearings that carry the load are surely put on their mettle. Yet Hyatt Roller Bearings in applications like this, and every other tough job in the mill, are equal to the task.

Tables, cranes, motors, and all other auxiliary mill equipment, along with all kinds of cars, are made better performing, longer lived, and more carefree when Hyatt equipped.

Let us show you how well and how long Hyatts can serve on any of your new mill equipment or changeovers. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J., Chicago, Detroit, Pittsburgh, San Francisco.

HYATT *Roller* BEARINGS

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ IN A FEW days the automotive industry will celebrate formal conclusion of the fourth decade of its meteoric existence in this country and without ceremony will launch on a new ten years of progress. In the period 1930-40, the industry, having attained its maturity, leveled off as far as production was concerned, although steady progress was realized in giving more value for the car buyer's money. Five good years —1930, 1935, 1936, 1937 and 1939— were experienced, and five bad years. Total production for the decade was 32,384,700 cars and trucks, or well in excess of all current motor vehicle registrations.

This is an average of about 3¼ million cars per year, slightly below what the industry's statisticians consider the "normal" level of output on the basis of present population and national income.

Despite the fact that in the past ten years there has been a concentration of car production among the big three producers with resultant pressure on the few remaining independent producers, in general prosperity has favored car builders, even in depression years, more so than it has other basic industries.

It seems altogether likely such a condition will prevail for the next decade and that profits of motor companies will continue to be substantial. Further consolidation of independent manufacturers will have to wait until time has either eliminated or blended the conflicting personalities in these companies.

As far as mechanical progress in automobiles is concerned, there have been many milestones, the most important of which was the universal adoption of the all-steel body and top. No little credit for this development is due steel producers for their unflagging efforts toward improving the drawing qualities of sheet steel and making wider sheets available in quantities. Vacuum spark control, drop center wheel rims, built-in trunks, synchronized front and rear springs, improved vision, catwalk grilles, independently sprung front and rear wheels, steering column gearshifts, airfoam rubber seat cushions and sealed-beam headlights are other important innovations of the past ten years.

What of the next decade? Certainly there will be no slackening of engineers' efforts to improve motor cars still further; this they are forced to do by the competition for the public's dollar. So, despite the dangers inherent in long-range forecasting, a few predictions of things to come may be in order at this time. First, an entirely new conception of motor car construction in respect to chassis and body seems certain. The present system of building a body separately and then bolting it to a chassis will give way to a new concept in which the entire car is built up on a skeleton— of steel tubing sections possibly—

Forming Chevrolet Fenders

■ **Stamping of Chevrolet front fenders presents an intriguing photographic study, as this portrait of the "works" of a deep-drawing press illustrates. Stack of fenders, completely formed except for trimming and punching the headlamp hole, is shown at left**

and body panels then welded to this type of frame. Such a design of course is not distinctly new, Lincoln Zephyr now using it to a certain extent, but it is not used in the mass-volume field. Packard was already to start a car built along these lines last spring, and then dropped the project. Revival at some future date is likely.

Engines will have to be made much lighter than at present, perhaps dispensing with water cooling systems altogether and even changing the shape of the engine. When this is done, power plants can be moved to the rear of the car and drivers can be placed at the extreme front where they belong.

It seems doubtful whether plastics can make any appreciable inroads on steel for body panels in the next ten years, although the possibility must be recognized. Some visionary engineer might produce a sensation if he could perfect a body in which the entire superstructure, or that portion above the so-called belt line, was of high-strength curved glass, even including the roof. Thus would be provided all the pleasurable sensations of riding in an open car without the bothersome effects of wind and weather.

Question of Cost

The automatic transmission will become established firmly in the next ten years as standard equipment, probably even on the lowest-priced cars. It is only a question of the skill of machine tool builders in supplying equipment which will permit production of essential parts to necessary tolerances at a cost which will allow volume production at a figure not in excess of what present transmissions entail. A variation of the present Hydramatic transmission supplied by Oldsmobile, in which changes of gear ratio are accomplished electrically instead of hydraulically, is conceivable.

Some improvements certainly will be forthcoming in the present storage battery as a reservoir for electric power. The automobile is constantly making more demands upon the electrical system to power auxiliaries and with ample facilities for current generation the need is being emphasized for a new system to store power and supply it to accessories at a constant rate.

Glass with ample strength to withstand all normal impacts encountered by motor vehicles is virtually at hand now. In a few years, even further improvement can be expected to the end that glass may become a structural material instead of just something to look through. Consider the novelty of glass wheels, perhaps in bright colors with running lights behind them.

Greater realization of the potential energy in gasoline is a certainty. Boosting from 15 to, say, 30 per cent the power obtained from a given quantity of gasoline is by no means inconceivable and would mean many dollars saved for motorists.

■ DEATH claimed two pioneers in the steel and motor industries within the past ten days, both of them widely known and liked by hundreds of buyers and salesmen catering to the automotive industry in this and other territories. Don P. O'Keefe, for 34 years active with Buick and Chevrolet in the purchasing divisions and later general p. a. for Chevrolet, succumbed Dec. 18 after a year or more of poor health. J. D. Jones, alloy steel sales manager in Detroit for Youngstown Sheet & Tube Co., and at various times associated with Colorado Fuel & Iron Co., United Alloy Steel Co., Timken Steel & Tube Co., and Rustless Iron & Steel Corp., died suddenly in Toledo, O., Dec. 13.

Strangely enough O'Keefe and Jones were bosom friends and were familiar figures at lunch hour in the Recess club here in the Fisher building. Mr. Jones was in Toledo on a business trip with two associates, W. L. O'Neil of Detroit and William Mackenzie of Chicago. Mr. Mackenzie was taken ill in his hotel and Mr. Jones went to a drug store to get some medicine for him. He dropped dead while waiting for the medicine. Some think the shock of his passing may have hastened the death of O'Keefe five days later.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
Aug.	405,072	96,946	103,343
Sept.	175,630	89,623	192,672
Oct.	337,979	215,286	323,017
10 mos.	4,292,459	1,857,806	2,893,178
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Nov. 25	72,520	84,730
Dec. 2	93,638	97,795
Dec. 9	115,488	100,705
Dec. 16	117,805	102,905
Dec. 23	117,705	92,890

†Comparable week.

	Week Ended Dec. 23	Dec. 16
General Motors	49,110	49,355
Chrysler	27,135	27,400
Ford	25,800	25,275
All others	15,660	15,775

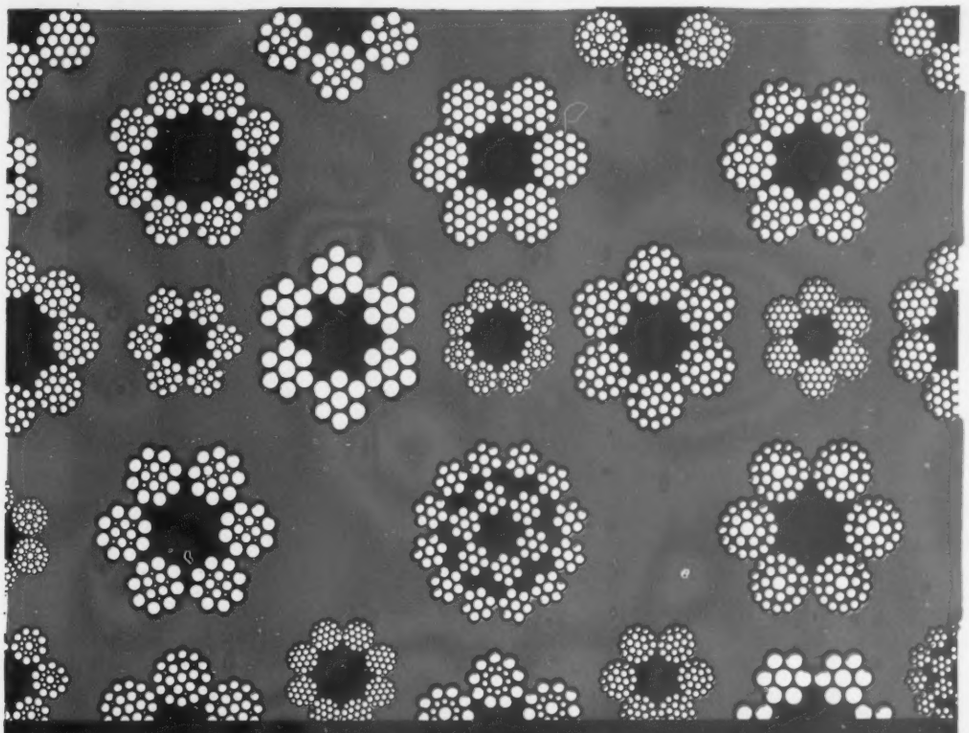
■ STEEL orders are perking up locally for automotive accounts, some of the large producers finding that heavy commitments made early in the fall are still not enough to keep abreast of intense rate of car assemblies. Ford this week is understood to be placing steel for an additional 100,000 cars. An earlier buy made for 430,000 cars and expected to carry production into February has been whittled down to the point where extra steel tonnage will be required shortly. Chrysler also is said to be experiencing shortages in some items, not anticipated several months ago.

While efforts are being made to have all shipments of sheet and strip tonnage placed while price concessions were in force last fall out of mills by Dec. 31, it is doubtful whether this can be done. One mill reports it will be shipping this tonnage through most of January, mainly as a result of some slowing down during the Chrysler strike.

Pressure on mills, especially those supplying stainless steel, tool steel, cold-rolled commodities and the like, is intense and buyers who were forewarned months ago that deliveries would be deferred have found that even a change from the "tough" to the "pleading" approach to suppliers is not producing results. A few cases of near tieups in production have been narrowly averted by a change in jammed mill schedules.

■ TESTS are being concluded on a new type of electric salt bath furnace here, said to be suitable for heat treating, heating for brazing and heating for forging stock. Eight years of research already have been expended on development of the furnace which operates on the principle of continuous current flow, variations in current flow being regulated in accordance with resistance of the salt bath which in turn is inversely proportional to its temperature

Galvanometer, electric eye, relays and a system of 3000 contacts giving small increments in voltage between 6 and 40 volts provide temperatures up to 2500 degrees, controlled to an accuracy within the limits of pyrometric measurement, according to the designer. Construction involves a conventional steel pot with a cast ceramic lining, permitting greater power input at the bottom and thus creating strong convection currents in the salt.



ALL CONSTRUCTIONS AND SIZES ARE MADE IN WISSCOLAY PREFORMED

Rope quality is important . . . but construction to meet conditions of use is likewise essential in reducing rope costs. Number of strands, relative sizes of wires, nature of core and kind of metal must be correctly combined to give you the longest possible rope life. You can get exactly the best combination for your use in Wisscolay Preformed. And as for quality . . . there is no better rope made than WICKWIRE ROPE.

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Editorial

The Investment Business

■ IN NEW YORK a stockbroker and his wife recently closed their home in the country, dismissing 11 servants. They now are living in an inexpensive apartment in a midtown hotel. Reason: The stock brokerage business isn't what it used to be. This is one of countless such instances resulting from reduced activity in the security markets and the trend toward transfer of the national financial capitol from New York to Washington.

In and around New York the cost of relief has been heightened materially by depression in the investment and security field. Wall street, in the lush days, was an important employer. Its big men were liberal spenders. Out of their profits came art, opera, greenhouses, fine country estates, yachts, country clubs, polo ponies, mink coats. All this now has changed. Many of the people who lived on these profits now are on relief.

Relief, of course, costs money, and harassed city officials must find it somehow, somewhere. When the state of New York last July levied a cigarette tax of 2 cents a pack, the city decided to collect an additional cent to provide funds for relief. It was anticipated that this levy would provide additional income of three to four million dollars per year for the city.

Boomerang Action of Restraint Adds To Relief Burden, Reduces Income

It has not worked that way. The city's cigarette tax income has dropped an average of $89,302 per month since July 1. Some citizens of New York have given up smoking, to the discomfiture of Virginia and North Carolina. Others are bringing them in from New Jersey at a saving of around 35 cents a carton. The city sent a young lady to jail for "smuggling" 20 cartons, but the figures speak for themselves.

At Washington, meanwhile, the temporary national economic committee is studying the investment business. It has been seeking evidence to prove that there is reciprocity in the investment banking business, that participating underwriters give and receive favors, and that this amounts to a concentration of control of finance and, possibly, a restraint of trade. There appears a basis for believing that the committee will recommend to congress that it pass a law to force competitive bidding for the right to sell new industrial securities. If that is done, some more stockbrokers and investment people may be even more discouraged than they now are, with the result that some more country houses will be closed and some more clerks and messengers will lose their jobs and apply for relief.

Best Objective Is Increased Flow Of Funds into New Financing

It is true that some of the features of the investment business at one time did need to be improved. That was true of most business at one time or another. It seems obvious, however, since those improvements have been made, the only kind of reform that should be tolerated under present conditions is relief from some of the uncalled-for rigidities that now hamper investment in legitimate business. One of the best things the temporary national economic committee could do is to concentrate on the problem of how to bring a great enlargement in the amount of sound, constructive, new financing which properly can be handled by the investment bankers. An effective move on just this one objective would help materially on relief, unemployment and many of our other ills.

The BUSINESS TREND

Index of Activity Reaches Highest Level Since 1929

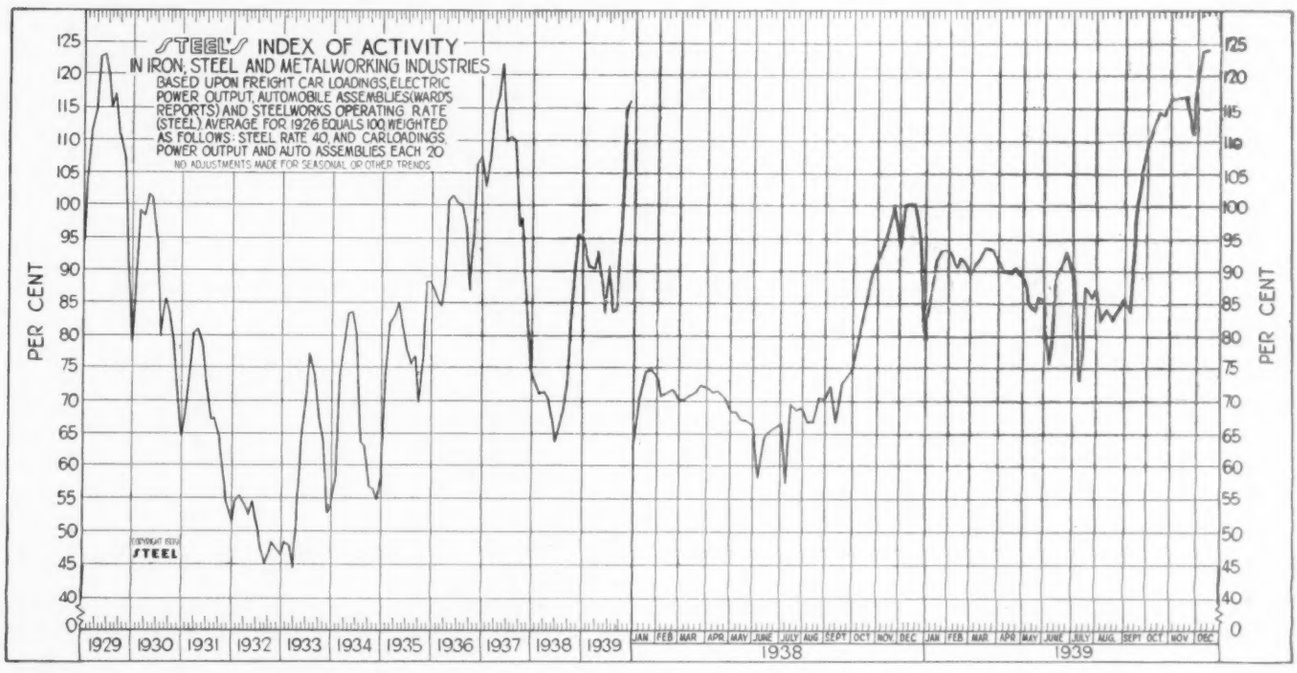
■ INDUSTRIAL activity is beginning to reflect the year-end influences in a decline in new order volume and in a few requests for postponement of shipments until after the inventory period. However, business on a seasonally adjusted basis is estimated at an all-time high for industry as a whole. In those lines which have experienced a slackening in activity, the recession has been less than seasonal in almost every instance.

Offsetting a moderate decline in the national steel rate and revenue freight carloadings during the latest period were encouraging gains in automobile production and electric power output. Reflecting this condition STEEL'S index of activity advanced 0.2 point to 124.1 during the week ended Dec. 16, to reach a new high since 1929. The current level of business activity in the iron and steel and metalworking industry, as recorded by the index, exceeds the peak reached during the 1937 boomlet but remains under the 1929 peak of 125.3.

Excluding Labor day week, steelmaking operations during the week ended Dec. 16, recorded the first decline in 22 weeks. The slight decline of 1.5 points in the national steel rate to 92.5 per cent was substantially less than seasonal. At this time last year the steel rate was 58 per cent, in 1937 the rate was 27 per cent and in 1936 it was 79.5 per cent.

The steel industry will enter the new year with a large backlog of unfilled orders, and despite the approaching inventory period only in a few instances have requests for postponement of shipments been received by steel interests.

Automobile output during the week ended Dec. 16 of


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100 WEIGHTED AS FOLLOWS: STEEL RATE 40 AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity gained 0.2 point to 124.1 in the week ended Dec. 16:

Week ending	1939	1938
Sept. 30	107.9	74.9
Oct. 7	112.5	78.9
Oct. 14	113.9	84.3
Oct. 21	113.6	88.7
Oct. 28	116.2	91.4
Nov. 4	117.1	93.4
Nov. 11	117.2	95.9
Nov. 18	117.3	100.4
Nov. 25	111.4	93.9
Dec. 2	117.9	100.1
Dec. 16	124.1	99.8

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.		95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

117,805 units, represented a new high since July 3, 1937, and compared with 115,488 assembled in the previous period. During the corresponding 1938 week output totaled 102,905 units. While retail sales have not held at the October-November level, order backlogs are sufficient to maintain an encouraging level of production throughout January.

Revenue freight carloadings during the week ended Dec. 16 declined to 681,166 cars. This represents a decrease of 6099 from the 687,265 cars loaded in the previous week. The current level of freight traffic remains well above that recorded during this period in 1938 and 1937, but is under the 1936 total.

Electric power consumption soared to another all-time high during the week ended Dec. 16. Total output amounted to 2,604,558,000 kilowatt-hours, compared with 2,332,978,000 in the like 1938 week, an increase of 11.6 per cent. In the previous week electric power consumption totaled 2,585,560,000 kilowatts. A high level of industrial activity in conjunction with seasonal influences have worked together in forcing this business indicator to record new all-time records in recent weeks.

Order backlogs in most industries are being gradually reduced, with shipments now exceeding incoming business. An encouraging development in recent weeks has been the decision of many firms to hold inventories at a substantially higher level than was practiced before the war, in line with the increase in operations and turnover.

A recent study on inventories and new orders, made by the National Industrial Conference board, indicates that there is little evidence, as yet, of unsound inventory accumulation by manufacturers, despite the recent sharp rise in production and buying of raw materials.

Continuation of the current levels of industrial activity, following the holiday interruptions, seems probable on the basis of the large order backlogs reported in many lines of business. The downward tendency in the volume of new business is also expected to be reversed soon after the turn of the year.

Where Business Stands

Monthly Averages, 1938 = 100

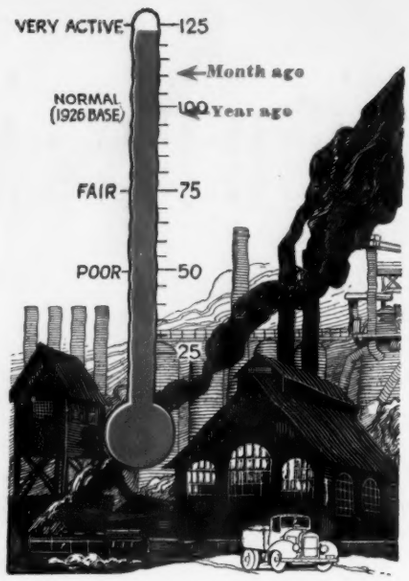
	Nov., 1939	Oct., 1939	Nov., 1938
Steel Ingot Output	232.4	229.4	158.0
Pig Iron Output	240.0	226.1	147.3
Freight Movement	129.9	147.0	109.7
Automobile Production	164.5*	146.0	176.4
Building Construction	112.5	98.0	113.3
Wholesale Prices	100.6*	101.0	98.6

*Preliminary.

Industrial Weather

TREND:

Sidewise



The Barometer of Business

Industrial Indicators

	Nov., 1939	Oct., 1939	Nov., 1938
Pig iron output (daily average, tons)	124,200	117,012	76,222
Iron and steel scrap consumption	4,025,000	3,974,000	2,732,000
Foundry equipment new order index	192.2	220.4	89.7
Finished steel shipments	1,270,894	1,218,545	679,653
Ingot output (daily average, tons)	210,101	207,455	142,889
Dodge bldg. awards in 37 states (sq. ft.)	$299,847,000	$261,796,000	$301,679,000
Automobile output*	364,000	323,017	390,350
Coal output, tons†	45,255,000	38,150,000	34,989,000
Business Failures:			
Number	886	916	984
Liabilities	$11,877,000	$16,140,000	$12,302,000
Nat'l Ind. Conf. board (25 industries, factory):			
†Av. wkly. hrs. per worker	39.0	38.2	36.7
†Av. weekly earnings	$28.24	$27.58	$26.14
Cement production, bbls.†	12,538,000	11,937,000	11,556,000
Cotton consumption bales†	686,936	624,902	543,857
Car loadings (weekly av.)	745,726	843,736	629,370

†October, September and October respectively.
*Preliminary.

Foreign Trade

	Oct., 1939	Sept., 1939	Oct., 1938
Exports	$332,079,000	$288,573,000	$277,668,000
Imports	$215,281,000	$181,461,000	$178,024,000
Gold exports	$15,000	$15,000	$16,000
Gold imports	$69,740,000	$326,089,000	$562,382,000

Financial Indicators

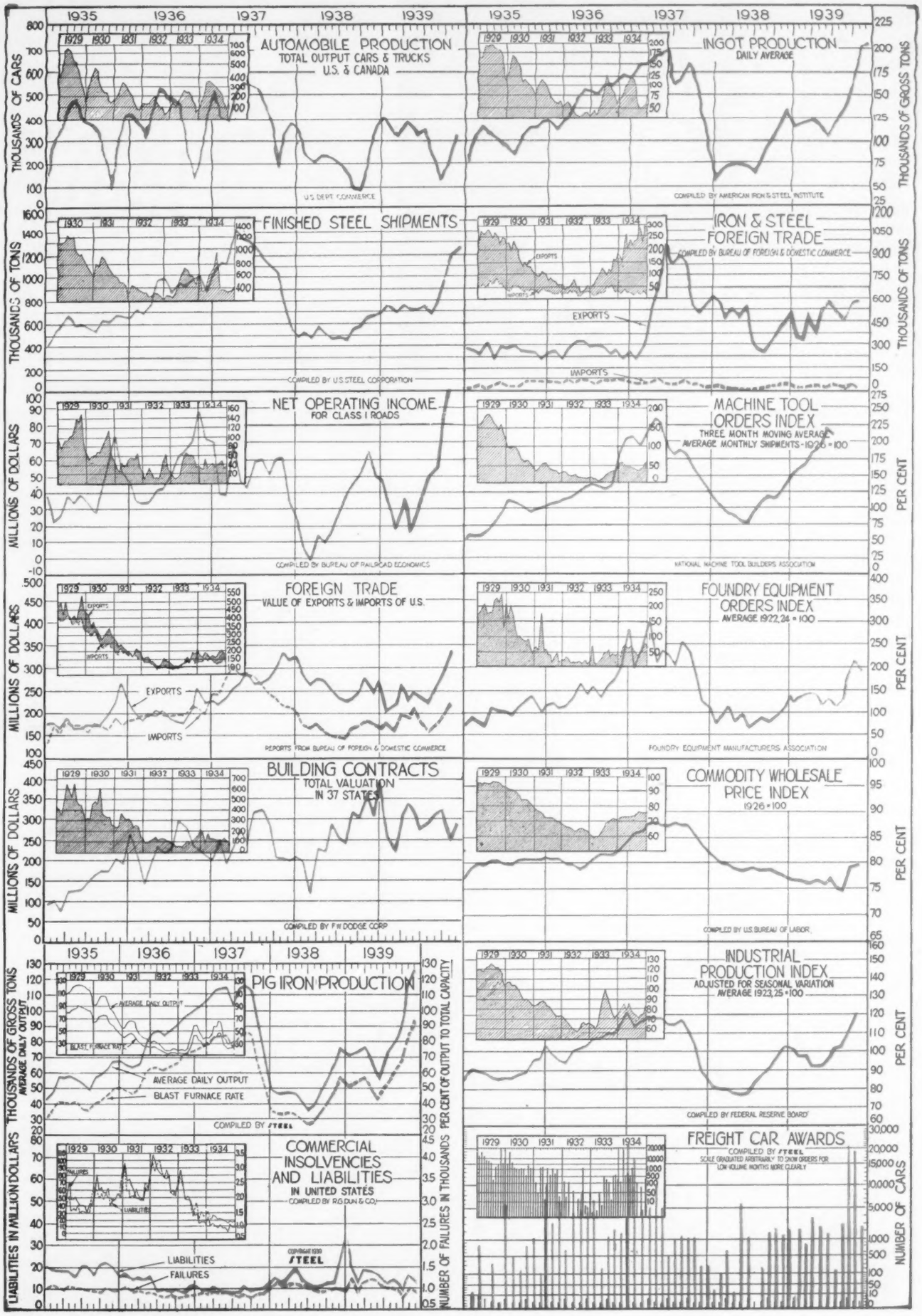
	Nov., 1939	Oct., 1939	Nov., 1938
25 Industrial stocks	$192.28	$194.82	$186.99
25 Rail stocks	$24.90	$25.84	$23.59
40 Bonds	$72.58	$72.75	$72.00
Bank clear'gs (000 omitted)	†$29,302,470	$23,820,000	$21,637,000
Commercial paper rate, New York (per cent)	⅝—¾	⅝—¾	⅝
*Coml loans (000 omitted)	$8,656,000	$8,521,000	$8,317,000
Federal Reserve ratio (per cent)	86.3	85.5	83.6
Capital flotations (000 omitted)			
New Capital	$21,408,000	$335,860,000	$220,893,000
Refunding	$125,140,000	$403,680,000	$174,914,000
Federal Gross debt (millions of dollars)	$41,305	$41,036	$38,607
Railroad earnings†	$101,616,477	$86,435,178	$68,594,809
Stock sales, New York stock exchange	19,219,736	23,733,664	27,922,955
Bond sales, par value	$151,867,000	$170,344,800	$156,222,675

†October, September and October, respectively.
*Leading member banks Federal Reserve System.

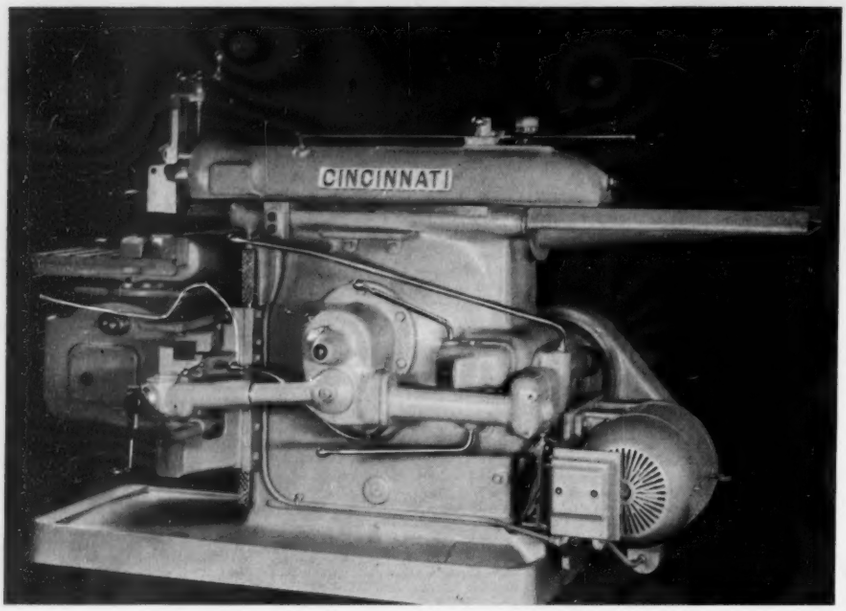
Commodity Prices

	Nov., 1939	Oct.,1939	Nov., 1938
STEEL's composite average of 25 iron and steel prices	$37.50	$37.62	$36.39
U. S. Bureau of Labor index	79.1*	79.4	7.75
Wheat, cash (bushel)	$1.08	$1.03	$0.78
Corn, cash (bushel)	$0.66	$0.65	$0.61

*Preliminary.

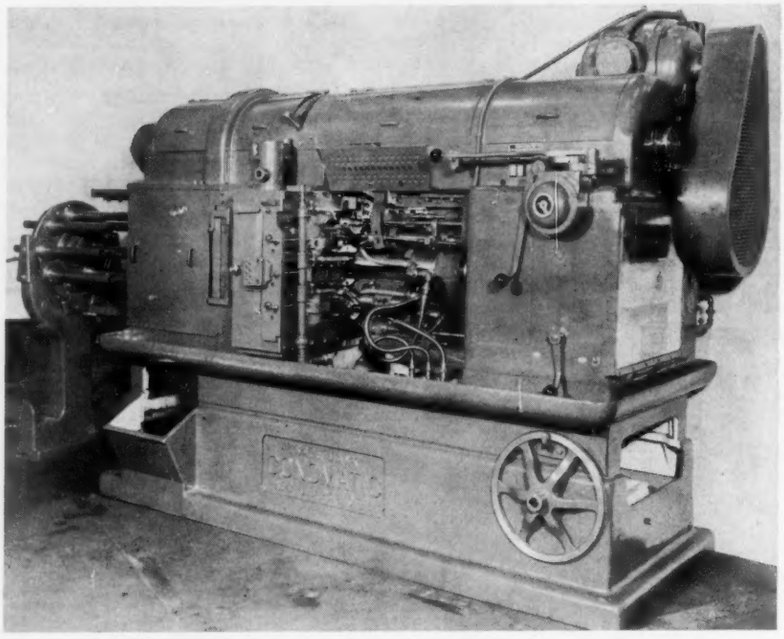

AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF GROSS TONS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
PER CENT
LIABILITIES IN MILLION DOLLARS
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
NUMBER OF FAILURES IN THOUSANDS
NUMBER OF CARS

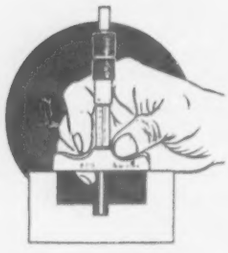
VERSATILE



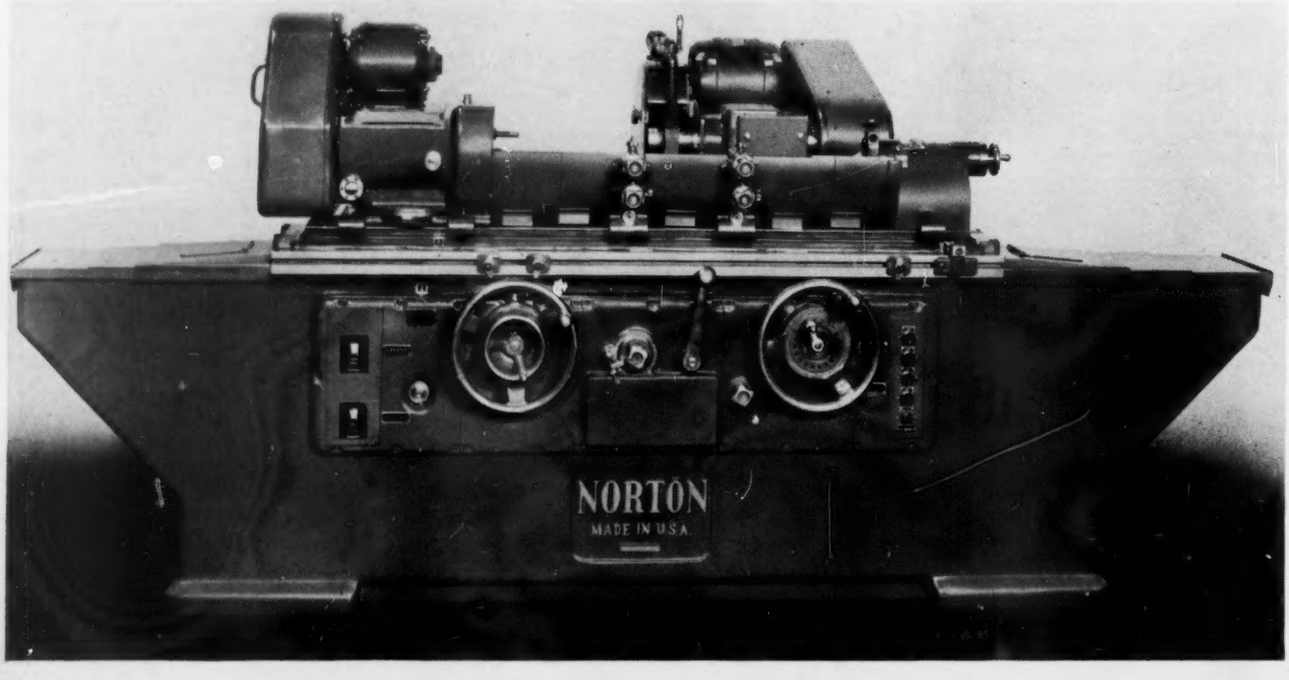
■ Cincinnati 24-inch universal shaper, above, has rail clamping, elevating and lowering controls on operator's side. Ram and rail bearings have rubber wipers. Cincinnati Shaper Co., Hopple, Garrard and Elam streets, Cincinnati

■ Conomatic six-spindle automatic, below, handles bar work up to 1¼ inches in diameter. Cams are overhead, fully enclosed, and bed design allows quick removal of chips without interrupting production. Cone Automatic Machine Co. Inc., Windsor, Vt.

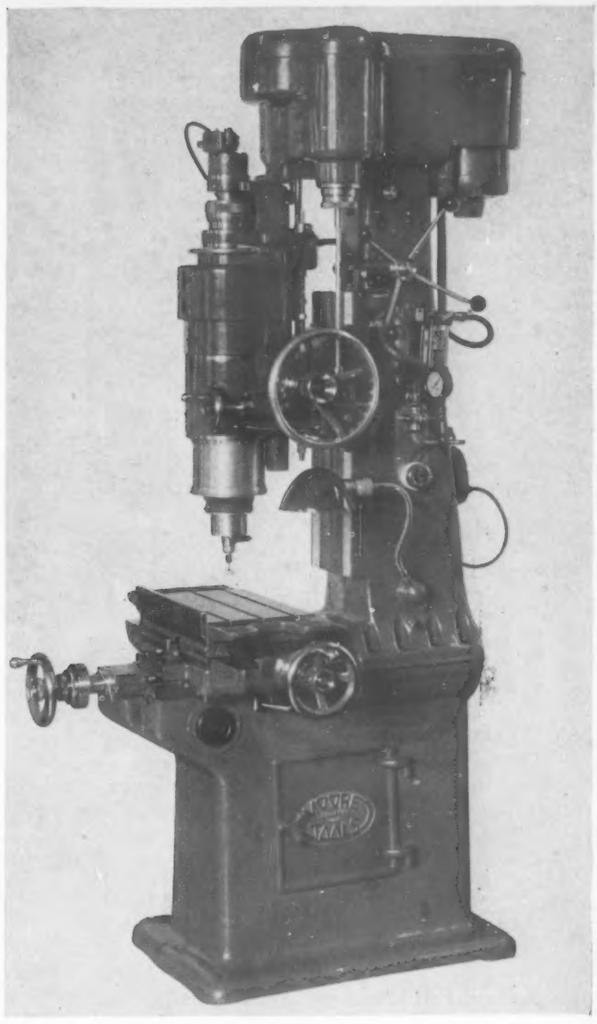




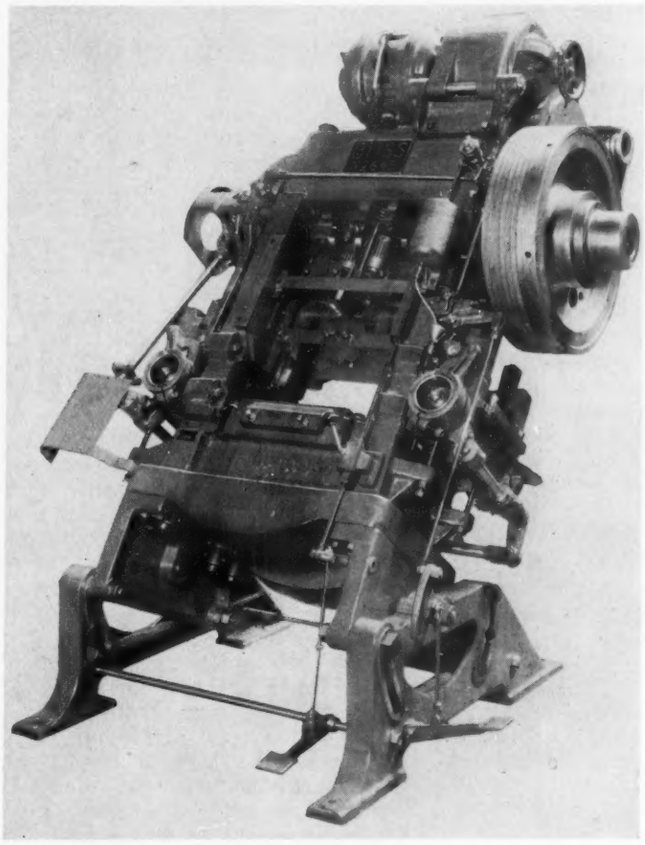
■ Norton type LC Multipurpose universal grinder, below, has four work speeds from 65 to 260 revolutions per minute, with constant-speed motor. Grinder swings 12 inches and is built in 24, 36 and 48-inch sizes. Norton Co., Worcester, Mass.



New Machines

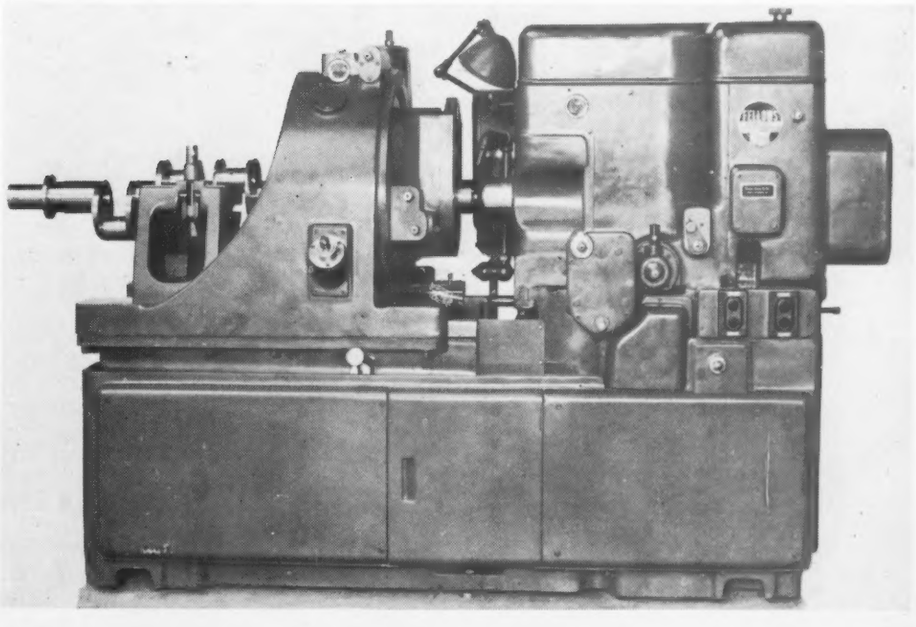


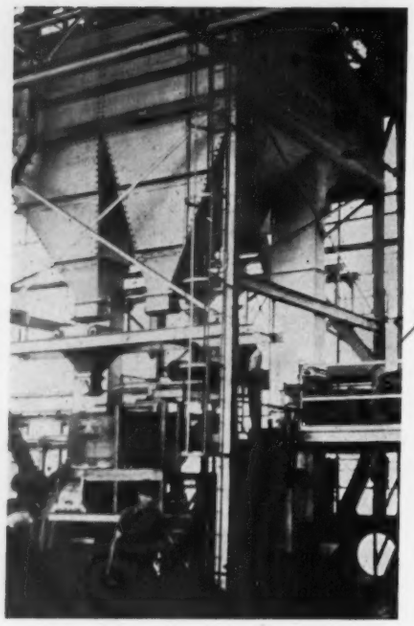
■ Moore jig grinder, above, is intended to correct locations of holes in jigs, master plates, etc. Grinding range is from 0.090 to 4-inch holes, either straight or tapered. Moore Special Tool Co. Inc., Bridgeport, Conn.



■ Bliss No. 645 high production press with inclinable frame, left, can be operated in any of three positions. Square pockets in legs support press. Bronze-lined gibbing is adjustable to 0.0005-inch. Operating speed is from 100 to 300 strokes per minute. Capacity is 65 tons. E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y.

■ Fellows Z-model horizontal gear shaper, right, is particularly suited for gears integral with long shafts. Movement of work slide is 19 inches; of cutter slide for external gears, 6½ inches; for internal gears, 2 inches. Fellows Gear Shaper Co., Springfield, Vt.





Overhead hoppers supply molding and core sands to individual mixers

Molding and

Important because of their extremely light weight and decreasing cost, magnesium castings are finding many new applications. Latest practice at plant with 1500-pound daily output is detailed here

By A. H. ALLEN
Detroit Editor, STEEL

■ MAGNESIUM, lightest of commercial structural metals, gradually is expanding its field of application, stimulated by progressive advances in fabricating technique and lower cost of the metal itself. With only 22 per cent of the weight of steel, volume for volume, 65 per cent of the weight of aluminum and 20 per cent of the weight brass, magnesium naturally offers advantages in aircraft parts, portable tools, truck and bus parts, as well as in such items as foundry flasks, matchplates, patterns, core boxes, assembly jigs and fixtures, which involve considerable manual handling.

Cost Going Down

Production of the metal in this country began about 1915. Ten years later, annual output had climbed to 10,000 pounds. In 1931 that figure had mounted to 127,000 pounds and in 1936 to 792,000 pounds. This year production will be well over the million-pound level. In 1935 the cost of metallic magnesium was 86 cent per pound. The price was reduced steadily until in 1937 it was 30 cents per pound. Within recent months another reduction brought the current price to about 26 cents per pound.

Pure magnesium is a silvery white metal, specific gravity 1.74, specific heat 0.25 and atomic weight 24.32, melting point 1204 degrees Fahr. and coefficient of thermal expansion per degree Fahr. at 65-750 degrees of 0.000016. Thermal conductivity in C. G. S. units from 100-300 degrees Cent. is 0.38.

In combination with other elements, magnesium constitutes about 2 per cent of the earth's crust. Mineral sources of the metal include magnesite, dolomite, carnallite and natural salt brines, the latter being at present the chief sources of magnesium metal. Brines of that nature are found in Michigan and Ohio and contain approximately 3 per cent magnesium chloride. This is separated, dried and broken down in electrolytic cells.

Magnesium and its alloys are available to industry in several forms. Nonstructural grades include ingot, powder, wire, ribbon and strip. Structural varieties include sand castings, permanent mold castings, pressure die castings, extruded rod, extruded shapes, rolled plates and sheets, and forgings. Three sources of supply are operating at present: Dow Chemical Co., Midland, Mich., pioneer in magnesium reduction methods and now making the metal in nearly all forms; Magnesium Fabricators Inc., Adrian, Mich., division of Bohn Aluminum & Brass Corp., supplying sand and permanent mold castings; and American Magnesium Corp., Cleveland, affiliated with Aluminum Co. of America. This article will be concerned primarily with the production of magnesium sand castings at the Adrian plant of Magnesium Fabricators Inc.

Beginning last fall, the project was initiated as a pilot plant for sand casting magnesium, with daily capacity of 1500 pounds, comparing with 3000-pound daily capacity of American Magnesium, and 1000 pounds for Dow Chemical. Foundry, 100 x 160 feet, is divided by a brick wall into two sections, cleaning and trimming room, and the foundry proper. Offices and laboratory occupy an additional 25-foot section across the front.

A 40 x 80-foot single-story building was erected on adjoining property for use as pattern shop and storage. These facilities will be transferred from the main building to make way for installation of a permanent mold division.

Casting magnesium is peculiar for three reasons: Molten metal has a high affinity for moisture, often an explosive affinity; molten metal will oxidize or burn rapidly if exposed to the open air; magnesium dust and fines form a high combustible mixture with air. Another inherent property of magnesium is lightness and lack of hydrostatic pressure required to force the metal into cavities of molds.

Obstacles Not Insurmountable

These peculiarities are not insurmountable in routine foundry practice. Affinity for moisture means that the green sand used in molding must be kept within the maximum range of 2.0 to 2.5 per cent in moisture content. As a further precaution, inhibitors are mixed with the sand to counteract the effect of moisture. A mixture of sulphur, sulphuric acid, borax and diethylene glycol is used, with a pure white silica sand. For molds, 3 per cent by weight of bentonite clay bond is added, and in cores, using the same sand, an oil binder is used. Sand of uniform grain size is employed and a careful check of permeability and moisture content

Casting Magnesium

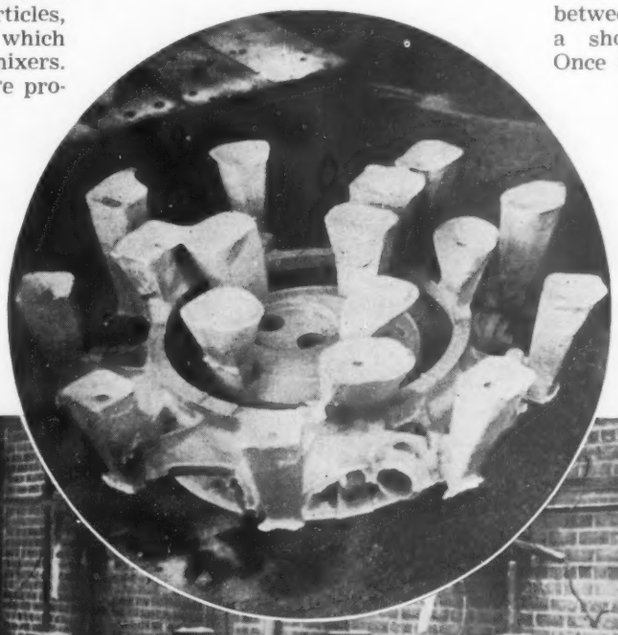
is kept constantly by laboratory control methods.

Sand for molds and cores is mixed in separate units. Core sand is transferred by wheelbarrows to eight wooden hoppers at the coremaking stations. Cores are washed with a mixture of flake graphite, plumbago and boric acid and are baked, usually overnight, in gas-fired ovens at 150 degrees Fahr. Four ovens are available, three accommodating two standard core racks. The fourth is a smaller quick-drying type for day service. Sand is in a closed system and after castings are shaken out falls through a grid and screen which removes foreign particles, then on to a bucket elevator which conveys it to the overhead mixers.

Four small jolt squeezers are provided for ramming small molds. Larger molds are made on two roll-over, pattern draw molding machines. Conventional wood patterns are made in the company's own pattern shop.

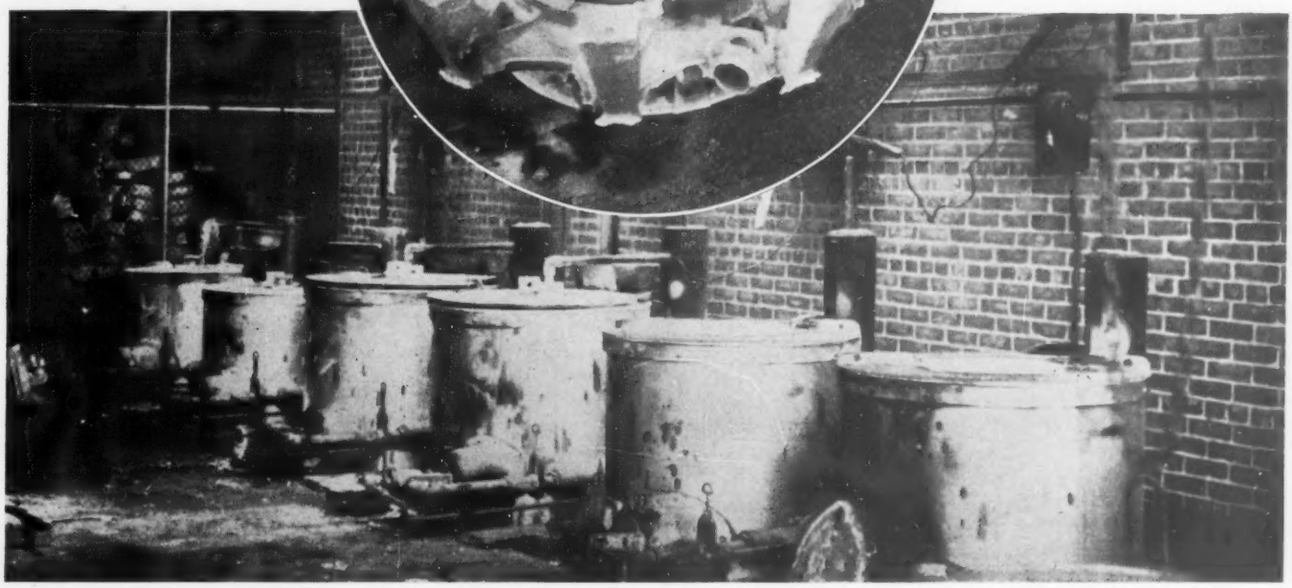
Light weight of the metal calls for a number of innovations in molds. Deep copes with many risers are required. Gating is designed to obtain maximum circulation of metal as it rushes into the mold. Metal usually is poured into a sand-lined wood pouring box from which is descends into a rectangular shaped sprue in the mold. On a large casting, the weight of gates and risers often is three times the finished weight of the casting itself.

Metal is melted in six oil-fired furnaces, accommodating either 100-pound or 200-pound pots formed of ⅜-inch boiler plate, arc welded and dished at the bottom. Sides have a slight taper and lugs are welded on at the upper rim to facilitate handling. They show an average life of approximately 50 to 60 heats. Charge comprises virgin metal and a portion of return scrap. After the charged pots are placed in the furnace, temperature is brought up to 1700 degrees Fahr., requiring about 45 minutes, then reduced to between 1550 and 1600 degrees for a short interval before pouring. Once molten, the metal in the pots



At right, seventeen risers are required on supercharger housing casting. Ratio of scrap to finish casting weight often is as high as 3 to 1

Below, six oil-fired furnaces accommodating either 100 or 200-pound steel pots are used for melting the magnesium alloys



must be kept covered to prevent burning at the surface.

When ready to pour, pot is transferred to a ladle shank, handled by two men, and carried to a waiting mold. At this point, granular calcium is sprinkled on the top of the molten metal as a further precaution against oxidation. The calcium burns slowly, and thus protects the magnesium beneath. Just before the ladle is tipped for pouring, the flux on top of the bath is skimmed back and a mixture of boric acid and sulphur is dusted over the pouring box. As the metal comes up in the risers, this powder is dusted over the exposed surface.

As the metal streams from the ladle, it is a glistening, rusty red color. A steel wool strainer placed in pouring box holds back any pieces of flux which may get by lip of pot.

Close Tolerance on Castings

Castings are shaken out 15 to 30 minutes after pouring, depending upon size, and then are dispatched to the cleaning department. After sand-blasting, gates and risers are sawed off on bandsaws. Portable grinders give the surface an initial smoothing. Pneumatic chisels, grinders and other portable equipment touch up the surface. Many magnesium castings, especially those for aircraft parts, must be kept within fairly close tolerances, 0.030-inch for example and consequently a rather extensive amount of hand cleaning and finishing operations is necessary.

Optimum physical properties call for a special heat-treating operation and a low-temperature aging, known technically as solution and precipitation heat treatments, respectively. Solution heat treatment, at 730 degrees Fahr. for 10 to 12 hours with an air cool, increases tensile strength, elongation and impact toughness. The precipitation treatment or aging, at 375 degrees increases yield strength with some sacrifice of elongation and toughness.

For all heat treatments, a circular electrically heated furnace is provided, with capacity of 1500 pounds of castings. Sealed from outside atmosphere, a fan in the base circulates furnace atmosphere which is largely sulphur dioxide, obtained by burning sulphur in the furnace.

Following careful inspection, castings are given an anticorrosive treatment known as a chrome pickle. This is nothing more than a quick dip (about 10 seconds) in a hot solution of sodium bichromate, concentrated nitric acid and water, in the ratio of 1.5 pounds of bichromate, 1 pint of acid and water to make 1 gallon. This produces an irridescent, yellow-red coating on the surface which is intimately bonded in the metal, provides a good base for subsequent painting, and has definite anticorrosive properties.

In localities away from sea coasts, magnesium alloys have good resistance to corrosion, but are subject to pitting or roughening in salt atmospheres. All castings made by Magnesium Fabricators are given the bichromate treatment as added precaution against corrosion.

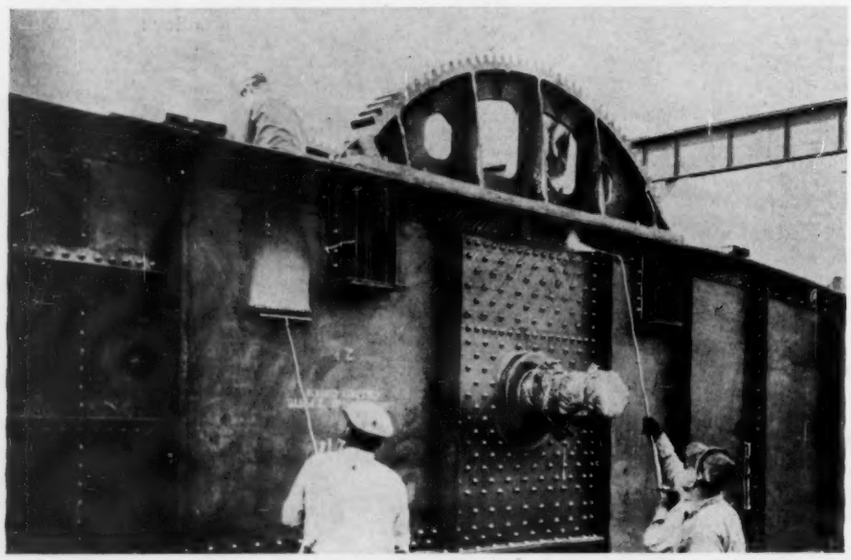
So far, all castings produced have been of an alloy known as X-7, although there are a number of other alloys in the so-called Magalloy series, the proprietary name applied to products of the Bohn division. X-7 analyzes 6 per cent aluminum, 3 per cent zinc, 0.15 per cent manganese and the remainder magnesium. The metal is supplied in pigs by the Dow Chemical Co., and no alloying is necessary in the melting operations.

Many Fields To Be Explored

As far as applications are concerned, there are many fields yet to be explored, but a few parts already produced in sand castings in quantities include supercharger housings weighing about 33 pounds for Pratt & Whitney air craft engines; accessory cases for airplane engines, carrying fuel pump and other devices; supercharge impeller for Allison airplane engine; transmission cases for buses; tire carriers for buses; numerous types of power tool cases; cutter bars for lawnmowers; matchplates, patterns, flasks and core boxes for foundry use; tractor parts; engine oil pans, and others. Large magnesium alloy castings made in this plant include a special aircraft casting scaling 60 pounds, and others weighing up to 72 pounds.

This light metal is claimed to offer special advantages in most all average instances where fair strength combined with exceptional lightness is a prime consideration.

Flame Cleaning Increases Paint Life



■ To prepare this steel bridge girder for painting, these high-temperature oxy-acetylene torches are quickly passed over it to drive off occluded moisture from within and beneath the surface. The result has proven beneficial in reducing flaking and increasing paint life. Photo courtesy Air Reduction Sales Co., 60 East Forty-second street, New York

♦

Manual of Steam and Hot Water Heating

■ *Steam and Hot Water Fitting*, by William T. Walters; cloth, 184 pages, 5½ x 8¼ inches; published by American Technical Society, Chicago; supplied by STEEL, Cleveland, for $2.

This is a manual for students, apprentices, draftsmen, steamfitters and designers, covering the principles of good heating. It stresses the value of design according to good practice, use of the best equipment in full knowledge of what it will do and correct installation.

A chapter is devoted to panel heating, a method just beginning to be used in this country, but which the author predicts will become standard practice. It is well illustrated with halftones and diagrams. Numerous tables provide engineering data. An index aids in finding desired facts.

Rubber Clutches

New traction principle provides a smooth-acting unit having uniform pressure over entire engaging surface. Also permits absorption of vibration, angularity and misalignment. Simplicity, light weight and self-adjusting characteristics shown

■ THE SAME engineering principle which prevents cars from skidding on wet and slippery pavements has made possible a new type of mechanical clutch. When the multi-vaned-tread tire was perfected by General Tire & Rubber Co., Akron, O., it was brought out that, under braking pressure, the many narrow vanes or ribs of rubber squirmed into a serpentine form and clung to the road surface with a high degree of adhesion. Adhesion being the principal job of a clutch, it was only a step from the multi-vaned tire to the Airflex rubber clutch.

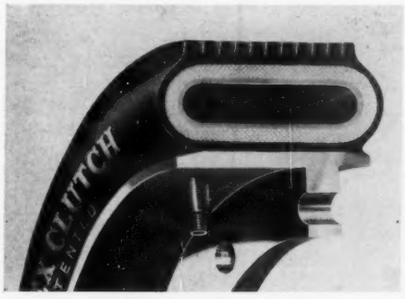


Fig. 1—Cutaway section of clutch member showing fluted tread, multiple plies of tire fabric and premolded tube. Casing is vulcanized to brass plated rim

Essentially, it comprises an inner expanding and contracting member of heat resisting rubber stock with a premolded rubber tube coated on the inside to resist oil fumes which might accumulate in an air compressor. The casing with its squeegee tread encloses multiple plies of tire fabric, the number depending upon the size of the clutch. It is mounted on a brass plated rim which in turn is mounted on the rotating shaft.

Unlike an auto tire, the casing is not open on the side contacting the rim but is closed completely as shown in cross-section view, Fig. 1. Also the brass rim is permanently bonded to the casing to permit transfer of torsion through the assembly without the casing slipping on rim.

Lining of Two Types

Although the above describes the expanding type, illustrated in Figs. 1 and 2, the clutches may also be of the constricting type as shown in Fig. 3. Two distinct types of linings can be used on both types. When excessive slippage is encountered and where loads are to be picked up gradually, the use of a friction lining is recommended. When the plain rubber squeegee tread is used, a reasonable amount of slippage can be tolerated if the engagements are not too frequent.

Advantages claimed for the design include uniform pressure on the entire surface, ability to absorb a reasonable amount of angularity and misalignment, simplicity of construction, light weight and self-adjusting characteristics. The rubber clutch has many of the proper-

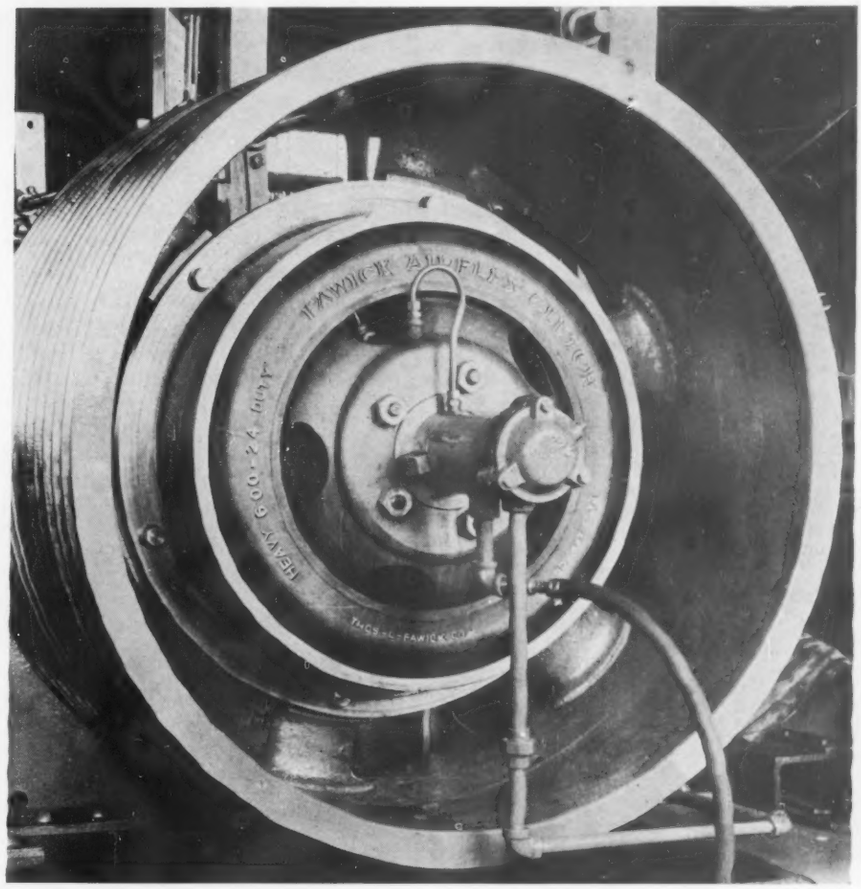


Fig. 2—Oil well rig with 24-inch expanding rubber clutch using squeegee tread for friction surface. Note air lines used to inflate clutch

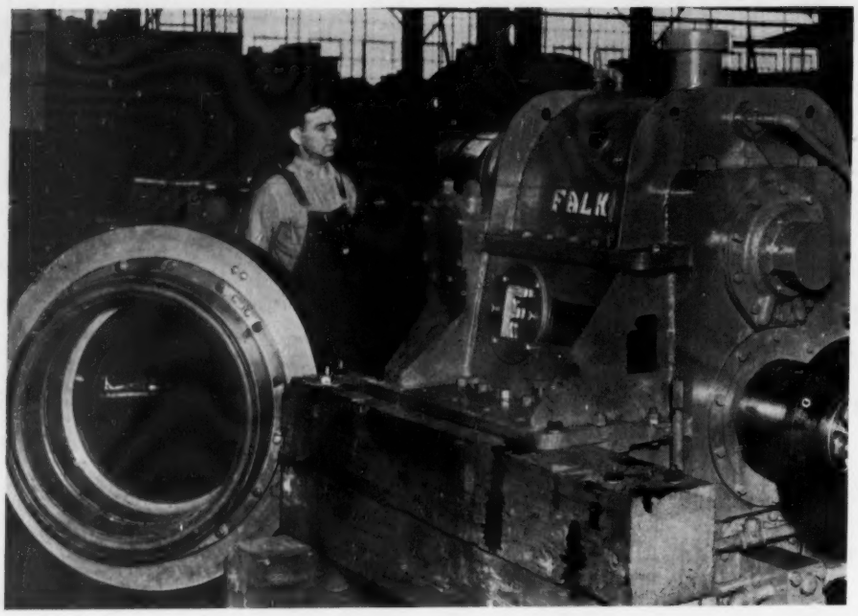


Fig. 3—Two 30-inch constricting-type rubber clutches at left mount on this reduction gear which is connected to a 950-horsepower marine engine

ties of a coupling; in fact, some couplings are now in use which are nothing more than an inflated rubber tire expanded into a receiving ring and connecting stationary power sources to generators, compressors and like equipment.

A complete line of Airflex clutches now is being developed by the Fawick General Co., Akron, O., affiliated with General Tire & Rubber Co. These are suitable for industrial purposes such as machine tools, conveyors, diesel-electric generators, etc. Larger applications already have been made in the marine engine and oil well fields. Largest clutch made to date is a 40-inch model with 3000-horsepower capacity. It is used on a marine engine.

High Wear Resistance

Licenses for distribution of the Airflex marine-type clutch have been granted to the Falk Corp., Milwaukee, which recently adapted two 30-inch constricting-type units. Fig. 3, for installation between a reduction gear and a 950-horsepower marine engine operating at 750 revolutions per minute and driving a 130-ton towboat on the Mississippi river. In a test of this installation it was found that after 1400 consecutive reversals from full ahead to full reverse in less than 3 seconds each, the high spots had not even been worn off the lining.

Tests also showed that the rubber clutches converted vibrations of low frequency and high magnitude to high frequency and low magnitude. This characteristic may be quite desirable in certain applications as a means of reducing vibration.

♦

Acme-Gridley Operator's Book

■ A HANDBOOK of 124 pages covering design, construction, tooling and operation of models R and RA, 4, 6 and 8-spindle bar Acme-Gridley automatics has been issued by National Acme Co., 170 East 131st street, Cleveland. A 6-page cross-indexed table of contents at the beginning of the book is augmented by a full-page "phantom" illustration of a typical machine. This insures an immediate clear understanding of the interior construction, as well as location and nomenclature of all important mechanisms and parts.

For purposes of progressive study, the book is logically divided into six parts. Part 1 describes and illustrates fundamental design and operating principles common to all the 4, 6 and 8-spindle bar machines. Part 2 deals with general details of construction and Part 3 with those of the Model R machines. Part 4 deals with the wide variety of standard tools and attachments and their effective use in reducing production time on various classes of work. Attention is given to elimination of secondary operations which otherwise would require transfer of the parts to another machine for finishing.

A large fund of practical information is to be found in Part 5, which is devoted to the estimating of production, changing over of jobs, and setting up and operation of the machine, in line with day-to-day production activities in the average shop. In this section are described and illustrated typical tooling setups on a wide variety of 4, 6 and 8-spindle jobs, as successfully accomplished by experienced National Acme tooling engineers.

Charts and Tables Included

The final section is devoted to charts and tables pertaining chiefly to selection of cams and gears, composite dimension charts and drawings covering the tooling area of all the machines, advisable surface feeds and speeds, revolutions per minute, and various tables useful to automatic users. The book is bound in a tough Fabrikoid cover and its paper stock is especially coated to withstand the effects of oil, cutting compound and general rough treatment in the shop. It measures 6 x 9 inches. Wire ring binding which makes the book lie flat when open also provides for the easy insertion of extra sheets.

Due to the relatively high cost of such a complete book as this, its free distribution is limited to foremen, setup men and operators who today are actively engaged in production involving use of Model R and RA, 4, 6 and 8-spindle Acme-Gridley bar machines. Only upon such verification on the part of an applicant together with mention of the name of the company by whom he is employed, will this book be sent gratis. To all others, a nominal price of 50 cents will be charged.

New Industrial Finish

■ A new mar-proof, chemical-resistant, industrial finish for use on all types of metal products and known as Egyptian High Bake N-F-R has been put on the market by Egyptian Lacquer Mfg. Co., 1270 Sixth avenue, New York. It is furnished in a wide range of high gloss colors as well as black and white, and also two clears—a glossy and semiglossy finish. It can be applied by spraying or dipping and is available in a wide range of baking temperatures. On smooth metals one coat is sufficient, no primer being required.

For castings and other rough metal objects there are special undercoats for use in conjunction with the finishing coats. These are designed for air-drying but may be baked as a composite finish after application of the baking finish. When used as undercoats and top coats, the finish is rust-inhibitive. Excellent flexibility and adhesion for this finish are claimed by the manufacturers.

Truck-Storage Units

Damage and loss of small parts during handling and assembly operations are eliminated by use of special truck-storage units which are loaded in stockroom and wheeled to assembly benches where they conveniently serve the workmen

■ AN UNUSUAL method of handling the dozens of small parts that must continually be supplied men on subassembly lines in shops where a variety of different units are assembled in small lots has been worked out by Monarch Machine Tool Co., lathe builders, Sidney, O.

Since lathes are usually assembled in groups of less than 25 units of one size and type at a time, no standard mass production method of constantly feeding the same parts to the same work bench day after day is possible. The conventional method of solving such a materials handling problem is for the stockroom to bring a supply of parts to each assembler and pile them up on his work bench.

Storage Cabinet on Wheels

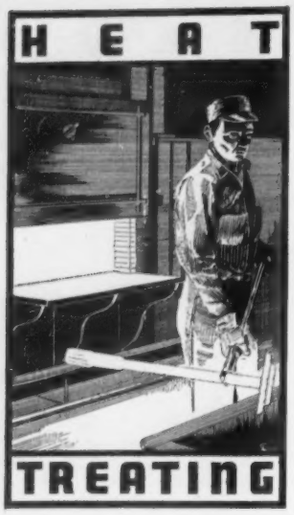
Monarch, however, solves the problem with specially designed cabinets that serve both as delivery trucks and storage units. These parts-assembly trucks, loaded in the stockroom with the supply of detail parts conveniently placed in handy compartments, are wheeled to positions alongside the workmen's benches in the assembly department and left there.

The parts are not removed, except as they are needed. In this way, no time is lost in transferring parts from truck to bench, and the parts are conveniently located in one place instead of being spread around on benches and in miscellaneous boxes and pans.

In addition, small items such as

(*Please turn to Page* 47)

Specially designed cabinets serve both as delivery trucks and as storage units in handling dozens of small parts on subassembly lines. Loaded in the stockroom, cabinets are conveniently placed alongside workmen's benches



Converting Worn Rolls

Worn work rolls from skin-pass mill are annealed, turned down to size and flame hardened for use as tension rolls. Necks, first shrunk with dry ice, are press fitted into reclaimed rolls

By W. F. LAUTNER

Supervisor
Applied Engineering Department
Air Reduction Sales Co.
Wheeling, W. Va.

■ MACHINE shop of the Yorkville, O., plant of Wheeling Steel Corp., Wheeling, W. Va., has developed a method for salvaging worn steel mill work rolls in co-operation with the applied engineering department of the Air Reduction Sales Co., New York. Up to this time, such salvaging had been considered impossible.

Principal product produced at this plant is tin plate and the work rolls of the skin mill, which give the tin plate the last or finishing pass, become worn in time to the point where they must be scrapped. Ordinarily scrap rolls are sold back to the roll manufacturer.

Observing this cycle of purchasing, using and scrapping rolls, some profitable use for the discarded rolls was sought. After much research work, it was found possible to work out a method of salvaging these rolls and processing them for further use.

Briefly, the scheme is this: First the discarded work roll, which is 18 inches in diameter, is annealed, see Fig. 2. This is followed by turning it down in a lathe to the tension roll size, which is 16 inches in diameter. Working surface then is flame hardened, giving a perfectly satisfactory tension roll. It is estimated that a saving of at least 75 per cent of the cost of the new roll is obtained.

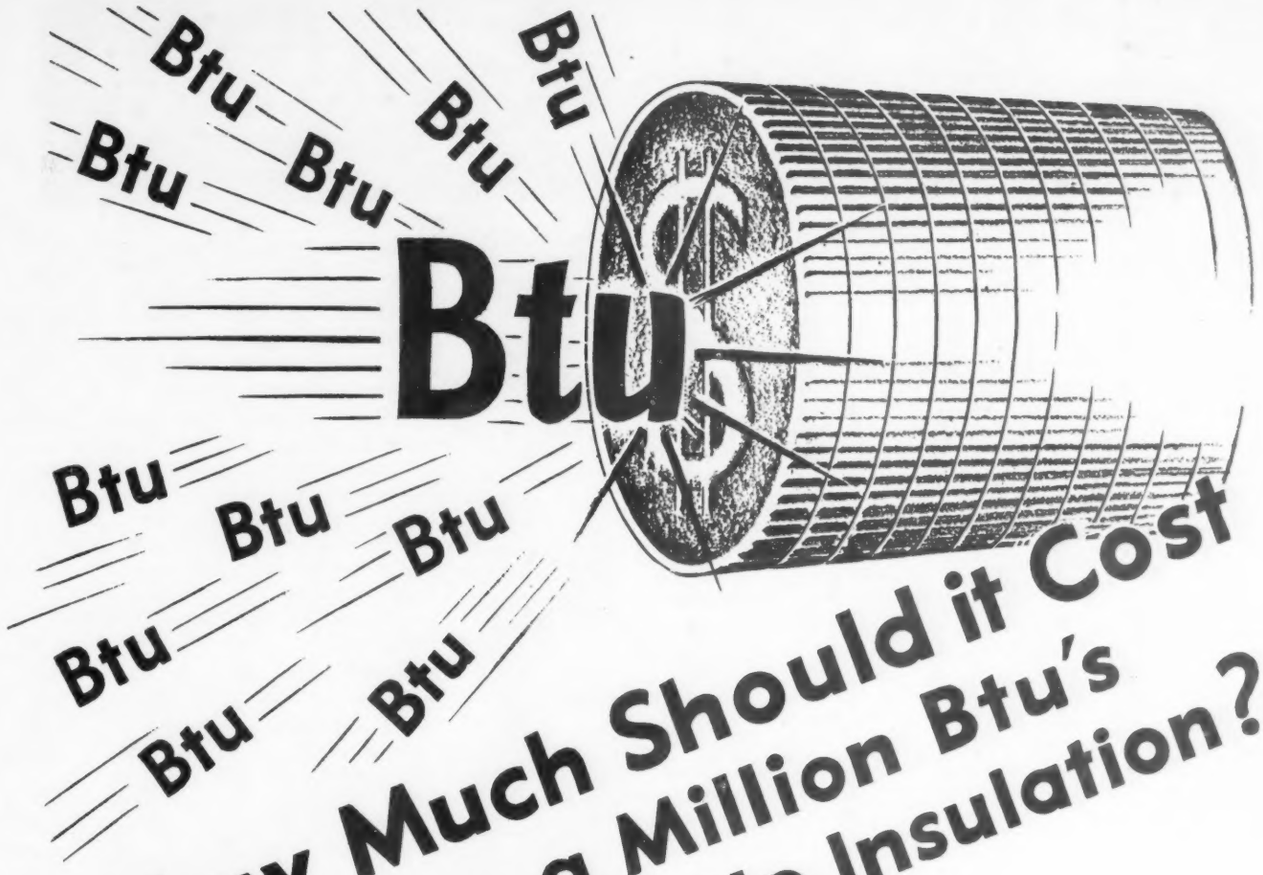
Records of cost and procedure employed in flame hardening these rolls were kept accurately. Time required for the 16-inch roll diameter was 2 hours. Roll face is 3 feet 6 inches long. Oxygen consumed totaled 390 cubic feet, with 522 cubic feet of acetylene. A tip 4 inches wide was used for flame hardening with 11 passes made around the circumference of the roll. Oxygen pressure was maintained at 15 pounds with 10 pounds acetylene pressure.

Fig. 1—Reclaimed roll being flame hardened. Pipe immediately to left of torch carries row of holes at its bottom through which quenching jets are directed against roll surfaces

Roll Kept Cool During Hardening

These rolls are 0.85 per cent carbon and have a scleroscope surface hardness of 30 after annealing, which is raised to 95 by flame hardening. This value of hardness appears to be most satisfactory.

Every precaution was taken to keep the roll cool during the entire flame-hardening operation. The water cooling produced by the jet built into the torch tip was supplemented by extra water cooling from a jacket built around each side of the tip in the form of a square made of ¼-inch pipe. The pipe was drilled with



How Much Should it Cost to Stop a Million Btu's with Backing-up Insulation?

An analysis of the cost of backing-up insulation for equal heat-flow through walls of various materials, shows as much as 40 per cent difference in the prices paid for accomplishing the same result.

A B&W refractory representative will, on request, show you how to avoid paying such unnecessary premiums—he will give you insulation-economy facts and other money-saving information as well. He can demonstrate, for example, how to get maximum insulating value per dollar cost, with B&W K-16 Insulating Firebrick. K-16's have:

(1) The unsurpassed stability of a fired-clay refractory product
(2) Low thermal conductivity
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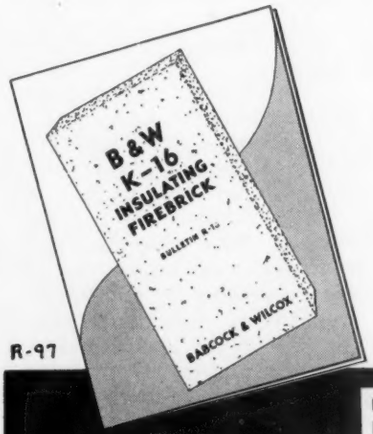
(4) High strength at all temperatures up to the recommended limits of 2000 F. for backing-up and 1600 F. when directly exposed.

Whether you want such information immediately or at some future date, a request for it now will bring it to you *when* you want it—without obligation.

Just off the press—this leaflet gives engineering data on B&W K-16 Insulating Firebrick. Write for Bulletin R-18.



R-97

THE BABCOCK & WILCOX COMPANY
REFRACTORIES DIVISION: 19 RECTOR STREET, NEW YORK, N. Y.

BABCOCK & WILCOX

Fig. 2—First step in reclaiming the rolls is to anneal them to permit machining down to desired dimension. Annealed roll is shown here

holes to shoot the water straight down on the roll. See Fig. 1.

The roll itself was immersed half its diameter in a water bosh supplied with running water as the roll turned in the lathe during the flame-hardening operation. The water bosh was fabricated on the lathe bed by welding 1/16-inch plate around the roll's half diameter with proper clearance for the roll neck. This precaution, taken to keep the roll cool during the entire process, is most important because if care is not duly exercised, surface checks may develop. Also, if stress is allowed to develop in the roll, it may crack when placed in service.

Another outstanding feature of the work of reclaiming old rolls other than the flame hardening of the surface is the unique manner in which the necks are fitted into the rolls proper. Fig. 3 shows how the necks are press fitted into the roll after it is machined down to tension roll dimensions. It is necessary to fit new necks into the finished roll because the old rolls are cored through the center. This cored hole reduces the possibility of the roll breaking and also tends to keep the roll at an even temperature while working.

When the work roll is turned down to tension roll dimensions, it is bored out for fitting the necks in the ends of the roll. The bore is 0.012-inch smaller in diameter than the outside of the neck fit. Necks are placed in a heavy corrugated paper container or box and covered with dry ice broken so it will pack snugly. After remaining packed for 18 hours, the extremely low temperature obtained reduces the diameter of the necks an average of 0.0015-inch per inch of neck diameter.

After removal from the dry ice pack, the neck immediately frosts over its entire surface. This frost must be removed before the neck is inserted into the bore of the roll. This is done by wiping with a cloth saturated with wood alcohol.

Bore Prepared

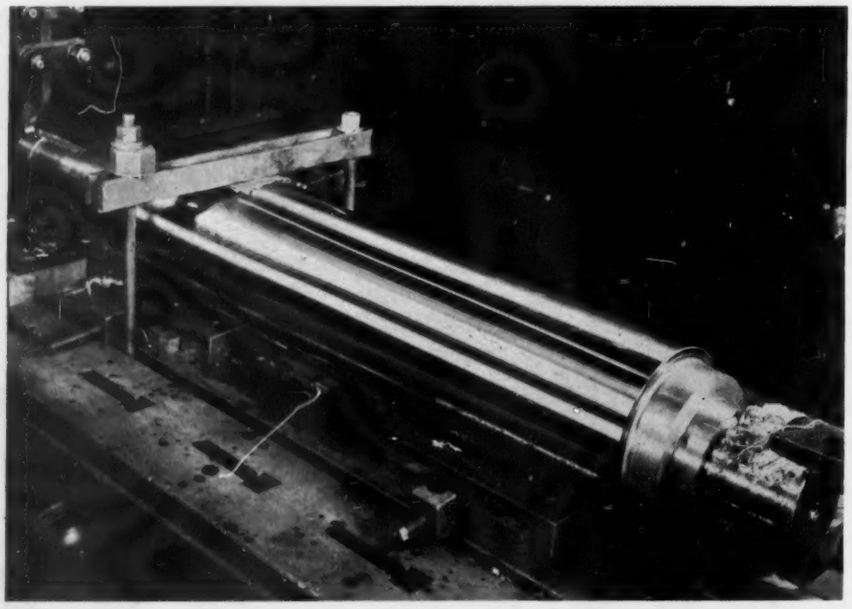
The bore, too, must previously be prepared by a light coating of a mixture of white lead and oil. These precautions are necessary if the desired press fit into the position is to be obtained. Otherwise the two parts will not go together regardless of the amount of pressure applied. When properly prepared, the necks are pressed into place under a pressure of 60 to 80 tons. This assures a roll neck that will never become loose. The flame hardening operation on the roll working surface is done after necks are pressed into place.

The second unusual operation accomplished in this mill is in making pinch rolls from SAE 1045 steel, subsequently flame hardened to get the desired surface hardness. This work is accomplished successfully at a saving of $600 on a set of two of these rolls.

These particular rolls have a face 44 inches long, and roll diameter is 10 inches. Time required to flame harden one roll was 2½ hours. During this time, 330 cubic feet of oxygen and 435 cubic feet of acetylene were used. A tip 4 inches wide was employed. Twelve passes were made around the circumference of each roll.

These pinch rolls have been in service six months and show no signs of wear. The surface conditions under which these rolls operate require an extremely hard surface. The service already obtained from these flame-hardened rolls is quite gratifying.

Fig. 3—Necks are press fitted into reclaimed rolls as shown here, first using dry ice to shrink neck



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Machinability Slide Rule

■ A machinability slide rule incorporating the findings of two years of research on machining of stainless steel has been produced by Rustless Iron & Steel Corp., 3400 East Chase street, Baltimore, and is available to those engaged in fabricating the metal.

By setting slide on chart to the type of stainless steel, speeds, feeds, and cuts may be read directly. Reverse of chart carries suggestions dealing with tool design, grinding and coolants.

Stresses Human Touch In Business Letters

■ *Better Business Letters*, by L. E. Frailey; cloth, 198 pages, 5½ x 8¼ inches; published by American Technical Society, Chicago; supplied by STEEL, Cleveland, for $2.

The author stresses the need for the human touch in letters from business houses and his pages are filled with suggestions for a style that will reach deeply into the heart of the recipient.

The text covers all types of business letters, with hints for making them compelling. An appendix contains lectures and quiz questions which make it a text for students and gives a test of their grasp of the principles laid down.

Locomotive Tender Tank

Egg-crate interlocked baffle plates in water tank for locomotive tender are arc welded, eliminating 8500 pounds of tees and angles formerly required. Huge ball-and-socket fixture cuts welding costs 50 per cent

By W. C. ROCKENSTIRE
Assistant Superintendent
American Locomotive Co.
Schenectady, N. Y.

■ IN DEVELOPING most effective procedure for building an all-welded steel locomotive tender tank, an unusual welding fixture was designed and constructed. This fixture includes a mammoth ball-and-socket joint able to support a complete tender tank, thus capable of placing at least 85 per cent of all welded joints in position for downhand welding.

Locomotive tender, in addition to carrying fuel for the engine, also carries a large supply of water—15,000 to 20,000 gallons not being unusual. To break up and control the surges of this water in the tank upon starting and stopping of the train, it is necessary to place a system of baffles inside the tank. This is accomplished in conventional construction by riveting T-sections vertically to sides of tank at location of every baffle. The baffles then are riveted to the web or projecting portion of the Tee. Several thousand pounds of dead weight is involved in use of these Tee-irons. In fact, actual dead weight of Tee and angle-irons in an 18,000-gallon tank is near 9000 pounds.

By using a welded construction,

From paper receiving $712.28 award in $200,000 Program sponsored by The James F. Lincoln Arc Welding Foundation, Box 5728, Cleveland.

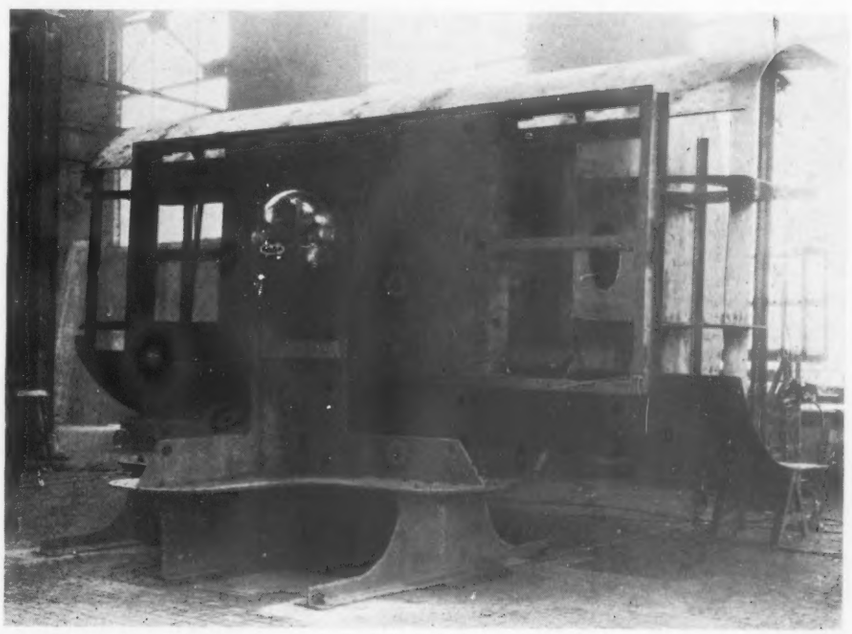


Fig. 1. (Upper)—Huge ball-and-socket fixture supports entire tank, permitting down-hand welding of all joints. Overhead crane with two hooks, one on each end of tank, turns tank and supports overhung weight

Fig. 2. (Lower)—Tank here is turned completely on its side, showing extreme flexibility of fixture

all of this weight can be eliminated. Use of some 10,000 rivets also runs up the dead weight of the locomotive. In the first attempt to use an all-welded design, the fabrication was changed from riveting to welding without making any other changes. It was found that most of such welding was done in a vertical position. This limited welding speeds and necessitated two or three separate passes on each weld using a 5/32-inch coated electrode. With 3000 lineal feet of welding done at an average speed of 7 feet per hour, this did not permit much saving in cost over former construction.

Seeking means of increasing the possible savings, some experimental work was done on positioning the whole tender so all welds could be made in a downhand position. This necessitated provision for turning the completed tank to eliminate long overhead and vertical seams.

Also, some means were sought to eliminate the 1200 holes which had to be laid out and punched for holding bolts during welding. Also, these holes had to be filled and ground smooth after welding. All of this indicated that for greatest economies, a tender tank should be designed for welding from the outset.

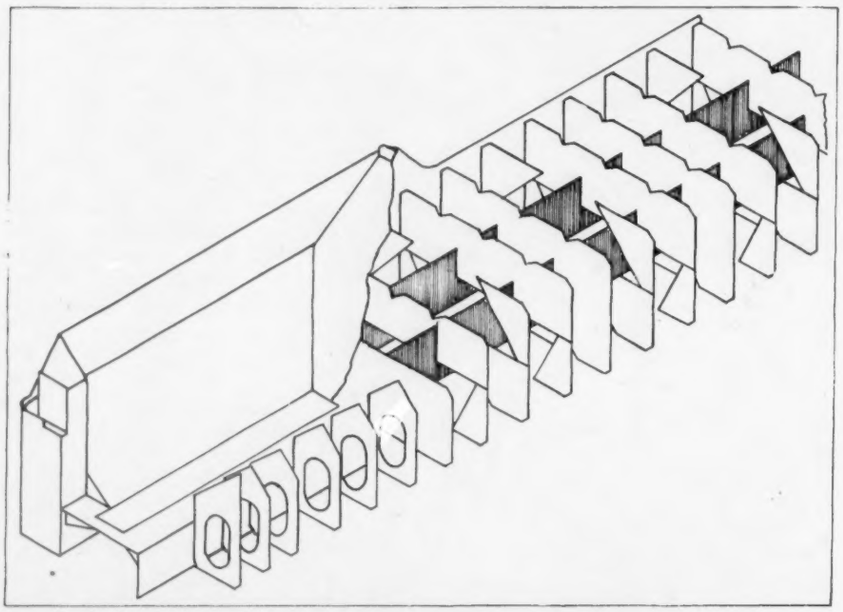
Accordingly, an egg-box type construction shown in Fig. 3 was developed. This constitutes the basis of the tender baffle system and permits the full economies of welding to be obtained when assembled on the ball-and-socket fixture.

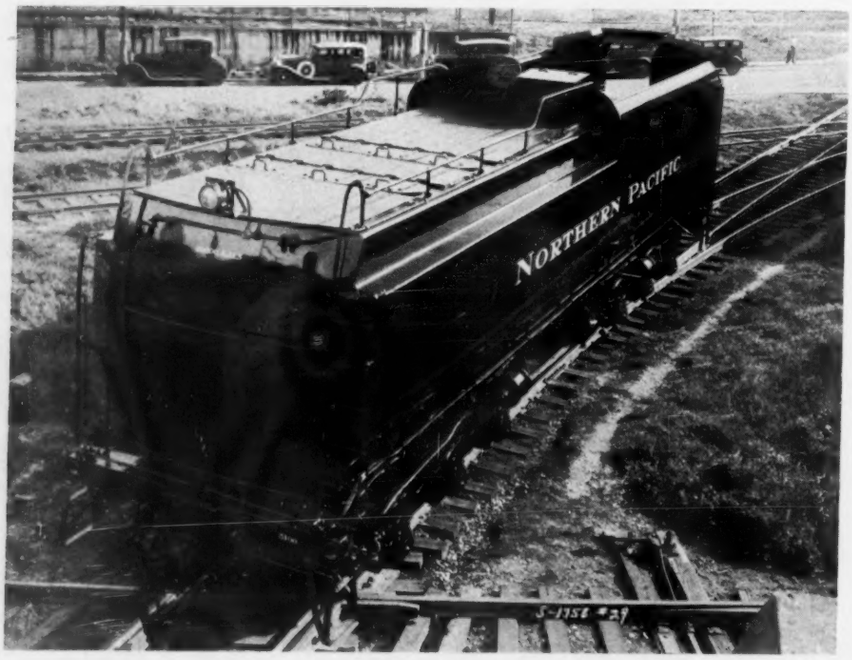
The egg-crate construction was a tremendous simplification in design and layout. It greatly reduced dead weight due to elimination of parts for fitting up. All T-irons, angle-irons, etc., are eliminated.

Method of assembly of the new tender is as follows: Plates are brought to the shear and located against a fixed stop for shearing. This assures accuracy on all plates without layout expense. Baffles then go to the nibbling machine where slots are nibbled into the plates. Again use of locating guides eliminates necessity of layout work. The slots produce the interlocking egg-crate construction shown in Fig. 3.

After thus being sheared and notched, all plates go to the erecting floor where they are assembled by means of a jig clamping the various members in place. After tack welding, work is removed from the jig and welding then is completed.

To obtain downhand welding on the multitude of joints, a huge ball-and-socket joint was built to support the complete tender tank, permitting it to be turned in any position necessary to bring the welds into position. Shown in Figs. 1 and 2, this permits the use of 5/16-inch diameter coated electrodes in 18-inch lengths, which for 3000 feet of welding means a cost saving of approximately 50 per cent from this item alone.





Electrode Costs Cut

This saving is effected in cost of electrodes due to greater efficiency in depositing metal in the downhand position. Also, the lower cost per pound of electrodes in larger diameters, plus a further savings of 8 per cent due to the ability to use greater lengths of electrodes with less frequent stopping of the arc for changing electrodes are important. All these factors give an even 50 per cent saving in cost of rods alone for producing fillet joints with a given throat when using this particular 5/16-inch electrode in the downhand position compared with using a 5/32-inch electrode in the vertical position.

An incidental saving not reflected in the above figures is the possibility of using less experienced operators as this work is less critical. It has been found that new men working on the ball-and-socket fixture and doing flat welding only are able to turn out acceptable work after only 100 hours in production.

Another factor that has proved important is that the top now is

Fig. 3. (Upper)—Diagram illustrates egg-crate construction which eliminated tees and angles

Fig. 4. (Lower)—View of completed tender constructed entirely by welding. Note smooth external appearance

left off completely, which means that the operators are not working in confined space with the dangers attendant thereto. In case of any trouble, the men can escape immediately from the compartments in which they are welding, and they are not subjected to fumes and smoke from the operation. This greatly increased safety is appreciated by the operators.

In the egg-crate construction used here, the top of the tank is placed on from the outside by means of accurately located slots through which plug welding is done, fastening the top to edges of the vertical plates. Because all pieces are cut to exact lengths when fitting up and because all welding is done with jigs and fixtures for locating the pieces, the plates are accurately located opposite the slots and so permit the welders to do the plug welding from the outside with no difficulty. It is believed that this is an important development in design of this new tender tank.

All Welded Tank Is Practical

Using this new design a completely welded tank is practical and is constructed at greatly reduced total cost. The savings are due to use of jigs and fixtures for positioning accurately all pieces of the assembly, and use of downhand welding made possible by positioning the complete tank on the ball-and-socket fixture. This latter permits use of large electrodes with heavy current and more continuous operation in laying bead, which in turn results in highest possible welding speed, better welds and lowest cost.

Importance to railroads of such a design can hardly be overestimated. Tender tanks rust out and deteriorate. In the past it has been the practice to repair these from time to time, but this is expensive and never entirely satisfactory. With the method of construction detailed here, a complete new tank can be substituted at extremely low cost.

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A.S.M.E. Lists Mechanical Equipment for Engineers

■ *A.S.M.E. Mechanical Catalog and Directory*, twenty-ninth annual issue; 494 pages; published by American Society of Mechanical Engineers, New York; supplied by STEEL, Cleveland, for $3 to non-members of the society.

In its catalog sections manufacturers describe machines, equipment and materials of interest to mechanical engineers. The directory section gives an index to American manufacturers of metals and alloys, power plant equipment, instruments, materials-handling devices and other types of equipment. A page reference system in the directory enables the reader to get a description of the machine from the catalog section.

The volume lists hundreds of trade names of equipment and materials for quick reference. An insert lists all A.S.M.E. publications, including American standards, power test, construction and safety codes, fluid meters, engineering biographies, bibliographies, research reports and manuals.

Insulating Lacquer

■ To insulate plating racks, a clear nonpigmented lacquer which can be applied directly on a clean metal surface is offered by Michigan Chrome Co., 6340 East Jefferson avenue, Detroit. It is said to be practically unaffected through the regular cycle of decorative plating and to have proven itself effective in processes involving concentrated or diluted hydrochloric acid or sulphuric acid dips, cyanide or acid copper baths, standard or bright nickel baths and chromic acid baths. It is also impervious to nitric and hydrofluoric acids and is satisfactory for use with degreasing units.

First-Aid For Burns

■ A preparation for tannic acid treatment of burns, known as "Tannoid", is available in collapsible tube containers for first-aid use from Davis Emergency Equipment Co., 55 Van Dam street, New York.

The preparation consists of a water-soluble jelly containing the proper proportion of tannic acid. When applied to burns, it is claimed to relieve pain, lessen toxic effect and reduce formation of scar tissue. Being water-soluble, it is easily and painlessly removable. Tannoid is nonfreezing at temperatures as low as 20 degrees below zero, Fahr.

Truck Storage Units

(*Concluded from Page* 41)

pins, washers, bolts and nuts are kept in handy 6 x 6-inch bins on top of the cabinet-trucks. Here there is no danger of their getting nicked, damaged or mixed in with other items. And they can not roll off to get lost behind or under benches. Also important, parts such as bearings that must be kept clean are actually kept clean because there is a hinged cover on tops of bins and all the compartments are thoroughly cleaned out each time the unit is reloaded in the stockroom.

These truck-storage units are of all-welded sheet-steel construction and consist of nine handy vertical compartments of different sizes, topped by 12 horizontal 6 x 6-inch sections. At the base is a 15 x 36-inch compartment, 27 inches deep, for extra large parts and storage of the subassemblies when they are completed. The units stand 4 feet high, and are narrower at the top than at the bottom so all levels can be seen afrom above. This makes them extremely accessible also as workmen can easily reach to the far bottom corner of any bin.

No doubt units similar to these could well be utilized in many fabricating plants having a similar problem of storing and handling small parts.

Electrode Metal Used To Repair Break

■ To quickly restore a steel mill to service, 400 pounds of steel in form of arc welding electrodes was melted into the break in a pusher head of a scale breaker by six welding operators. Mill was back in operation eight hours after start of job. Photo courtesy Lincoln Electric Co., 12818 Coit road, Cleveland

Slag Control

Slag cake characteristics, when thoroughly understood and recognized, permit short-cuts in obtaining the desired quality in low-carbon rimming steel for strip. Practice described here can be used to good advantage by the average melter

By JOHN B. MALLOY
Steubenville, O.

■ ONE OF the most useful developments in improving the quality of steel has been the introduction of slag control. By thoroughly understanding the various relationships existing between the slag and the steel, the open-hearth operator has removed a great portion of the uncertainty of meeting the specifications and replaced this uncertainty with a more than ample knowledge that the finished product will more than meet the eventual customer's requirements.

In the following discussion of slags, the term, iron oxide, is total iron reported as iron oxide. The carbon content of the steel, finished analyses, is definitely 0.10 per cent carbon or less. The slag cake used in this investigation is 4½-inch diameter and ¾-inch thick.

Description of Slag Cakes

The 16 slag cakes in the series are classified into four groups with four cakes in each group. The classifications are: Wrinkled, furrowed, shiny black and silvery.

Wrinkled Type

Slag No. 1—Cake definitely wrinkled throughout the top area. Wrinkled area spotted with dull black smudge in which shiny bright specks appear to glisten. Bottom of the cake is a dull gray color with little or no visible shine. Fracture is porous. Cake is brittle and upon breaking crumbles into small pieces. The powder obtained from crushing is a deep blue-black.

FeO value, 22 to 30 per cent; CaO/SiO_2 equal to or less than 0.60.

Slag No. 2—No wrinkles. Top of cake is a dull gunmetal color; bottom has acquired a partial shine. The fracture reveals a porous area on the top half of the fracture. The powder resulting from crushing is dark gray.

FeO value, 15 to 21 per cent; CaO/SiO_2, 0.65 to 0.80.

Slag No. 3—Top of cake slightly convex, smooth and dull black. Occasionally shiny black scales can be seen at the outer edge of the cake. Bottom of cake approximately 75 per cent shiny black. Fracture reveals only a slight porous area. Peculiar perpendicular spiny structure, which starts at the center of the cake and almost touches the top and bottom surfaces is visible in fracture. The crushed specimen is gray.

FeO value, 6 to 14 per cent; CaO/SiO_2, 0.80 to 1.00.

Slag No. 4—Cake used as key cake to determine low-iron oxide point in progress of slag. Slag throughout the top is covered with irridescent scaly area, similar to a mother of pearl formation. Scaly pattern visible when cake turns dark red upon cooling. The bottom of cake is covered completely with a black shiny luster. The fracture reveals a definitely defined needle-like or spiny structure which reaches top and bottom

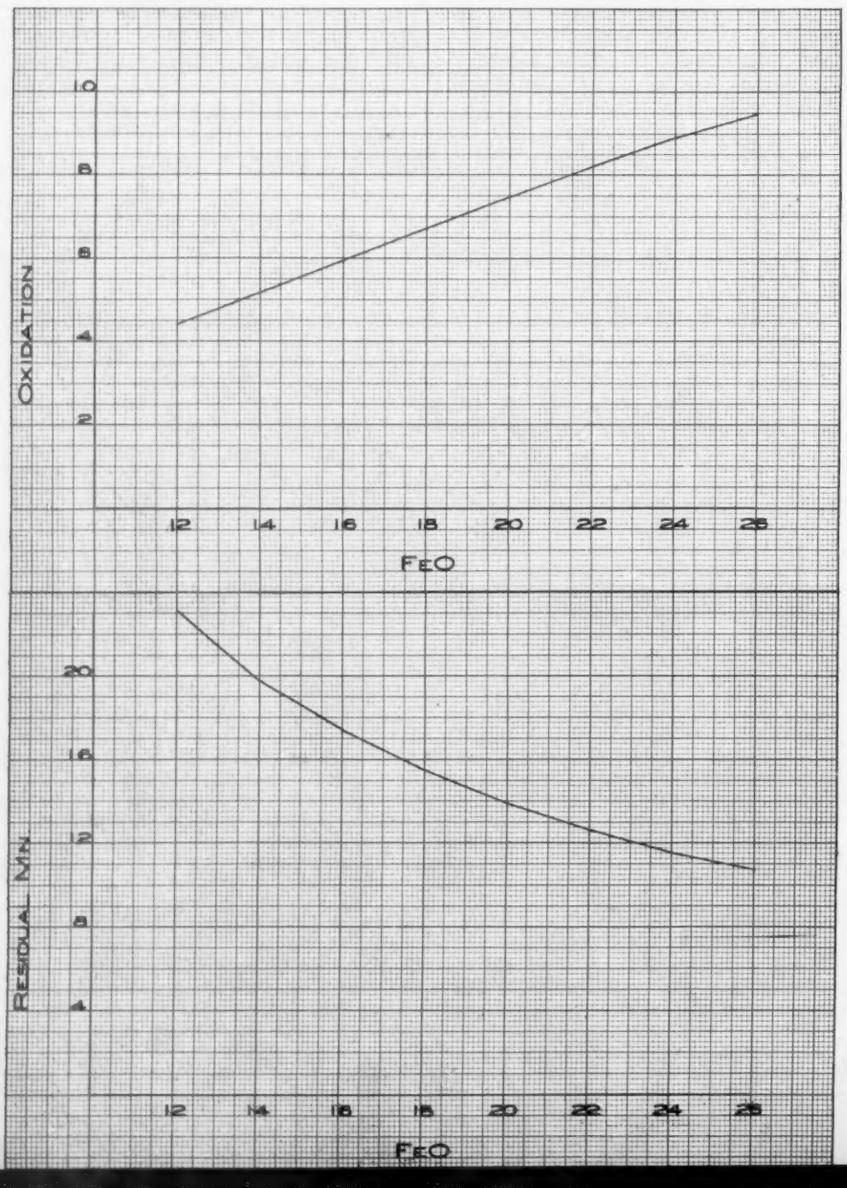


Fig. 1. (Upper)—Relationship between FeO in the slag and per cent metallic oxidation in bath. Fig. 2. (Lower)—Relationship between FeO in slag and per cent residual manganese

surfaces of cake and disappears in the black glassy edge of cake. This specimen marks the trend of the finish of an iron oxide reduction; wherein the previous slags were high in iron silicates, the slag from this point until the heat is tapped will show an iron oxide gradually increasing due to the oxidation. The powdered sample is light gray.

FeO value, 4 to 6 per cent; CaO/SiO_2, 1.00 to 1.20.

Furrowed Type

Slag No. 5—Cake is gray, furrowed and occasionally a small area of the scale pattern is visible. Bottom of cake is lustrous shiny black. Upon fracturing, a new structure, gray in color but distinctly stony, is visible. In the center a brown area is visible. This is indicative of a low-iron oxide value. The powder is grayish tan.

FeO value varies 6 to 8 per cent; CaO/SiO_2, 1.25 to 1.50.

Slag No. 6—Cake in physical structure resembles Slag No. 5, excepting the color. Top of cake No. 5 is gray; that of No. 6 black. Bottom of cake retains lustrous appearance. Fracture is similar to that of cake No. 5 but the color of the fracture is darker. The powder from this cake is light tan.

FeO value, about 7 to 9 per cent; CaO/SiO_2, 1.50 to 1.90.

Slag No. 7—Cake slightly furrowed and dull black throughout top surface. Bottom of cake is shiny black. Fracture is stony in appearance; visible at center of fractured cake is a brown and slightly porous area. Brown coloration indicates low-iron oxide value. Powdered specimen is a dark tan.

FeO value, about 9 to 10 per cent.; CaO/SiO_2 value, about 1.90 to 2.00.

Slag No. 8—Cake almost flat. Top area covered with gray film. Bottom of cake is shiny black. Fracture is stony; brown discoloration visible in the previous cake can barely be seen. Powdered specimen cake very light brown.

FeO value, 10 to 12 per cent; CaO/SiO_2 ratio, about 2.15.

Slag No. 9—Cake is black, shiny and convex and has round edges. Bottom of cake is lustrous, shiny black. Fracture is stony gray. Powdered specimen is light brown but slightly darker than the shade of slag No. 8.

FeO value about 12 to 14 per cent; CaO/SiO_2, about 2.25.

Slag No. 10—Cake slightly convex, black and shiny; bottom is shiny black. Fracture is gray black; glistening particles visible in fractured area. Powdered specimen is darker than the two previous cakes.

FeO value 14 to 16 per cent; CaO/SiO_2 value, 2.25 to 2.45.

Slag No. 11—Cake smooth, shiny black and flat; bottom is lustrous black. Fracture is gray black; glistening particles more numerous and more visible. Powdered specimen is cocoa brown.

FeO value, 16 to 18 per cent; CaO/SiO_2 value, 2.45 to 2.65.

Slag No. 12—Cake only offered to show effect of fluor spar addition to the heat. Top of cake covered with gray film; small pinholes visible throughout area covered by gray film. No FeO values or lime-silica ratio is offered as this condition is dependent of the time added. Individual cakes all show this condition after fluor spar additions.

Silvery Type

Slag No. 13—Cake is black and shiny; around outer edge a silvery luster is evident. Silver area covers about 25 per cent of total area of cake. Fracture reveals gray-black stony area in which glistening particles are visible. These particles are in proportion to total iron oxide content of cake. Bottom of cake is dull black. Powdered specimen is brown.

FeO valuation, 18.0 per cent; CaO/SiO_2, 2.65 to 2.75.

Slag No. 14—Cake is similar to slag cake No. 13. Silver area, however, comprises about 50 per cent of total area of top of cake. Top area is black and shiny excepting that portion covered by silver tone. Fracture reveals grayish black stony area with increased visible amount of glistening grains as in previously described cake. Bottom of cake is dull black. Powdered specimen is dark brown.

FeO value is 22.0 per cent; CaO/SiO_2 ratio, 2.75 to 2.90.

Slag No. 15—Cake resembles two previously described cakes. Silvery area comprises about 75 per cent of total area of cake; and, silvery area has begun to localize itself to center of cake, i.e. top area of the cake. This area is surrounded by shiny black ring. Fracture is a dark slate color and glistens with shiny particles, again in proportion to increased FeO content. Bottom of cake is dull black. Powdered specimen is reddish brown.

FeO valuation, 24.0 per cent; CaO/SiO_2, 2.90 to 3.00.

Slag No. 16—Approximately 95 per cent of total top area of cake covered with the silvery tone. Only small portion of cake shows shiny black outer ring on top. Fracture, similar to the other cakes in this classification, is decidedly stony, and very dark gray approaching a black color. Fracture seems to glitter with evident number of glistening grains visible. Bottom of cake is a dull gray-black. Powdered specimen obtained is a dark reddish brown.

FeO valuation 26.0 per cent; CaO/SiO_2, 2.90 to 3.10.

Aluminum addition to:

heat, lbs.	39
ladle, lbs.	33.5
molds, lbs. (total)	5.5

The actual manganese content of the ferromanganese is assumed to be 80 per cent. A total of 22 points of manganese is secured through a residual manganese of 0.14 and 0.008 per cent recovered from a furnace addition of 1000 pounds of 80 per cent ferromanganese added for a period of nine minutes elapsed time prior to tapping. The specification of 0.32 to 0.42 per cent manganese permits of an aim at 0.37 per cent manganese. Having accounted for 0.22 per cent manganese, the difference to be made up by a ladle addition is 0.15 per cent. The calculation to determine the quantity of

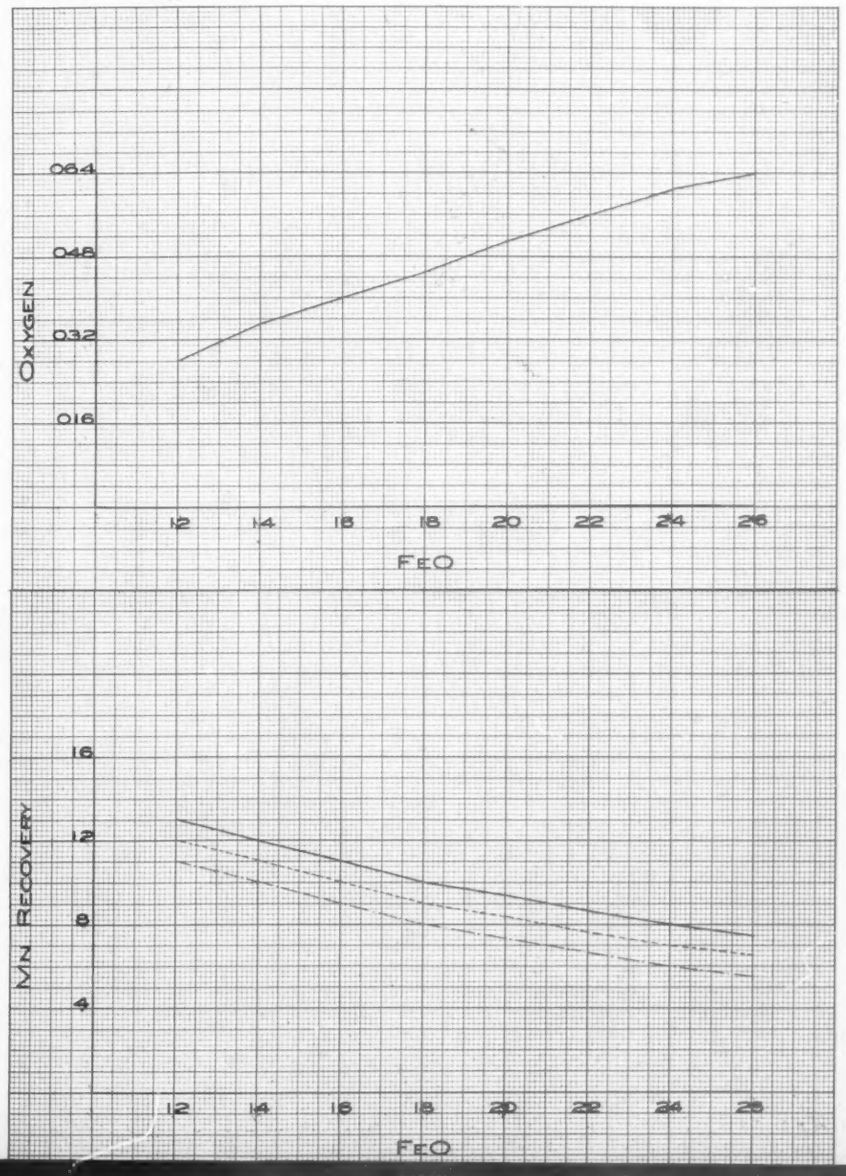


Fig. 3. (Upper)—Relationship between FeO in slag and per cent oxygen in metal. Fig. 4. (Lower)—Relationship between FeO in slag and per cent manganese recovery in furnace

ferromanganese to be added is as follows:

$$\frac{277{,}500 \times 0.15}{0.52 \times 0.80} = 1000 \text{ pounds}$$

The weight of the heat being established as 277,500 pounds and the ingot weight (individual) calculated to be 17,215 pounds will produce an ingot train of 16 ingots. The aluminum to be added to each ingot is 5.5 pounds or 88 ounces divided by 16 ingots or 5.5 ounces per mold.

The accompanying charts showing the relationship existing between the iron oxide in the slag and such factors as oxidation, residual manganese, oxygen, ferromanganese (furnace), ferromanganese (ladle), and aluminum, are composite averages gained from a detailed study of hundred of heats made under normal open-hearth practice. The averages are based on heats produced on individual furnaces over a period of a month, plotted against heats produced on every other furnace for the same period and a general average obtained. This average was plotted against results for succeeding months, the composite average being used in the accompanying graph. No range limits are offered inasmuch as a slight deviation may always exist but not sufficiently large to lead to a large error.

FeO and Oxidation

Because of exacting specifications now existent in quality steel, it is vitally necessary that the operator establish some fundamental starting point, from which he can continue until these stringent requirements are met. Fig. 1 reveals the relationship existing between the slag iron oxide and the percentage of metallic oxidation that has occurred in the furnace bath, based on the original charged weight. As an example of this condition, let us presume the slag cake has an iron oxide valuation of 18 per cent, the corresponding percentage factor of oxidation loss would equal 6.67 per cent of the original charged weight. If the standard shop charge per heat is 300,000 pounds, the actual metallic bath weight would equal the original charge less the 6.67 per cent oxidation loss or 280,990 pounds of metal remaining to be alloyed.

FeO and Residual Manganese

The amount of residual manganese present in the bath must be known, in order to meet the desired final ladle analysis. This relationship of slag iron oxide and residual manganese is shown in Fig. 2. The operator must know the factor because at this point he starts his program to meet the desired manganese analysis. If the slag cake has an iron oxide value of 18.0 per cent the corresponding residual manganese will be 0.155 per cent as shown on the chart. The importance of determining the residual manganese aids in determining the type of rimming action that will occur. Too high a residual manganese often tends to prove detrimental to the drawing qualities of the finished sheet. However, in many cases it aids in producing a better sheet when flatness is the major requirement.

FeO and Oxygen

Fig. 3 shows the relationship between the iron oxide in the slag and the per cent of oxygen in the metal. The necessity of having some definite information as to the amount of oxygen present in the metal aids materially in having some preception of the type of rimming action that is likely to occur when the heat is poured into the molds. To establish this relationship, simultaneous tests of two steel samples and a slag cake were taken from the furnace. The slag was analyzed for iron oxide and the steel tests for aluminum oxide and from this result the oxygen was computed. The steel tests were called "bomb tests" because of the shape of the test mold used. To the opening of the test mold was placed a cap with a cover attached, inside of which a definite weight of aluminum wire was placed. The bomb then was plunged in the center of the steel bath to avoid any slag contamination. Occasional tests were contaminated with slag, but these tests and any results that failed to check within 3 per cent of the oxygen value were discarded. Again assuming the iron oxide value of the slag cake to be 18 per cent the corresponding oxygen value of 0.045 per cent is found.

FeO and Manganese Recovery (Furnace)

Continuing the practice to meet final ladle specification for manganese, Fig. 4 is plotted to materially aid in accomplishing this end. As a method of deoxidation a standard addition of 1000 pounds of 80 per cent ferromanganese is made to each heat. This addition also serves

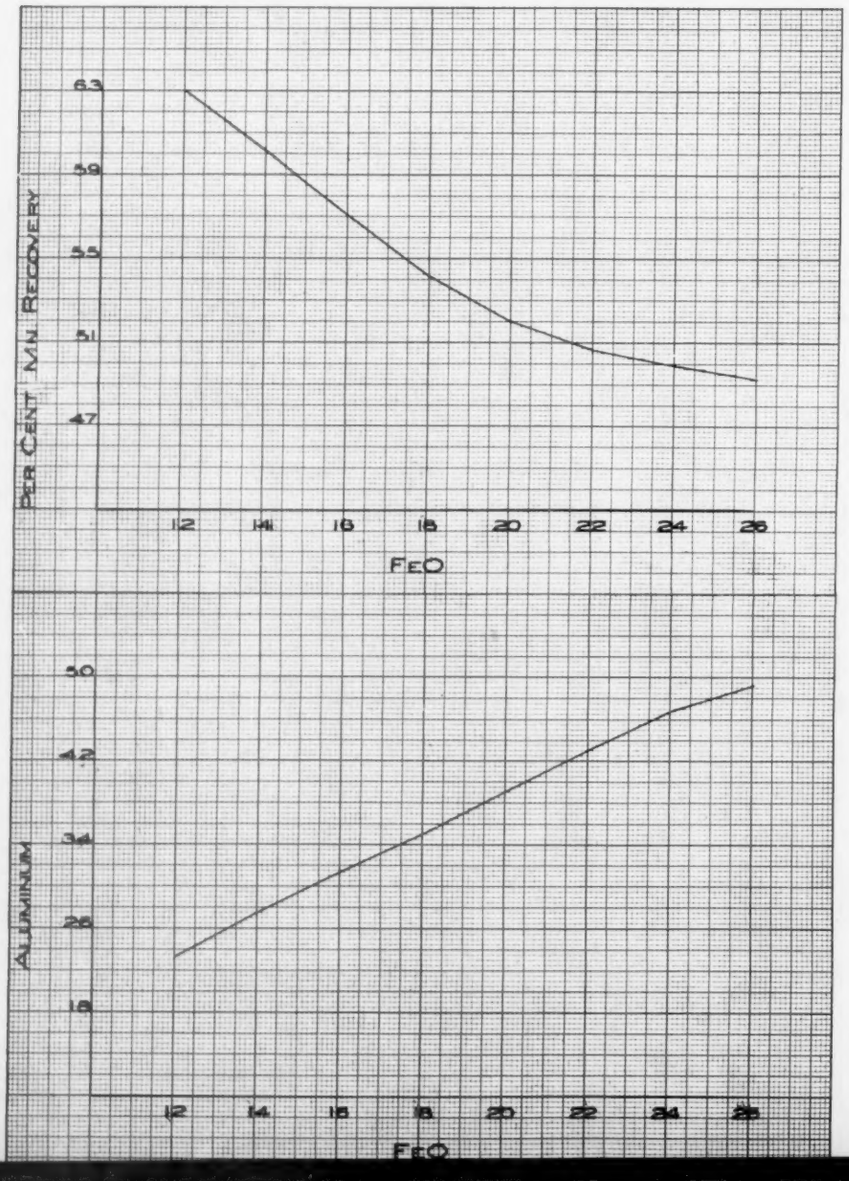


Fig. 5. (Upper)—Relationship between FeO in slag and potential efficiency of ladle additions of ferromanganese. Fig. 6. (Lower)—Relationship between FeO in slag and aluminum additions in pounds

as a desulphurizer. Manganese recovered in the bath after deoxidation has taken place is determined by this chart. The chart shows an elapsed time of eight minutes (solid line), nine minutes (dotted line), and ten minutes (dash and dot line) between the time of the ferromanganese addition and the time of tapping. Occasionally, due to a high preliminary sulphur, the elapsed time exceeds this ten minute limit and corrections must be made for the actual elapsed time. Fig. 4 is drawn on a basis of actual points of alloy recovered rather than a per cent recovery.

FeO and Ferromanganese (Ladle)

Fig. 5 shows the relationship existing between the iron oxide in the slag and the potential efficiency of the ladle addition of ferromanganese. The graph is drawn on a percentage recovery of manganese alloy and any multiple addition of 100 pounds can be computed easily from the percentage factor obtained from the chart. Assuming the slag cake value to be 18 per cent the efficiency of the ladle addition of ferromanganese is 54.2 per cent.

FeO and Aluminum

Highly important in the production of quality low-carbon rimming steel is the correct use of aluminum. In Fig. 6 the relationship between the iron oxide in the slag and the amount of aluminum, in pounds, is plotted on a basis of a definitely desired rimming action. A rimming action involving a drop of 1 inch produces the best quality product and the graph is drawn on that basis. In using this graph, another consideration is involved, i.e., the mold size. The graph is drawn on a basis of aluminum additions for molds, the dimensions of which are as follows: 24 x 34, 24 x 38, 24 x 42 and finally 24 x 48 inches. In molds whose dimensions are smaller; i.e., 24 x 30 inches less aluminum is needed because of the tendency of the steel to rise naturally. The converse is true; i.e., when the lateral face dimension of the ingot is greater than twice the thickness of the ingot. Observations of rimming action on the latter type ingots shows a flat rim or a rim of fall, 2 inches. The amount of aluminum added shop practice has been a ratio of 6.25 parts of the charted aluminum addition to be added to the ladle and one part to the mold train.

An example of the use of the charts is found in a typical open-hearth heat of low-carbon rimming steel.

The carbon specification to be a maximum 0.08 per cent and the manganese 0.32 to 0.42 per cent and the rolled strip to be 35½ inches wide and the coils to weigh a minimum of 6000 pounds.

The required mold size to meet this strip width would be one in stock nearest this dimension on the lateral face, or one 24 x 38 inches. The height to which the ingot must be teemed is 65 inches, producing an ingot weighing 17,215 pounds, from which a 12 per cent crop and butt discard is made, producing two slab cuts within the coil weight specification.

Charged weight of heat, lbs.	300,000
Slag, FeO valuation, %	20
Oxidation loss, %	7.5
Actual weight loss, lbs.	22,500
Remaining steel weight, lbs.	277,500
Residual manganese, %	0.14
% Mn. recovered on 1000 lbs. deoxidizer in furnace, 9 minutes	0.08
Oxygen in metal, %	0.051
Ladle eff. of ferromanganese, %	52

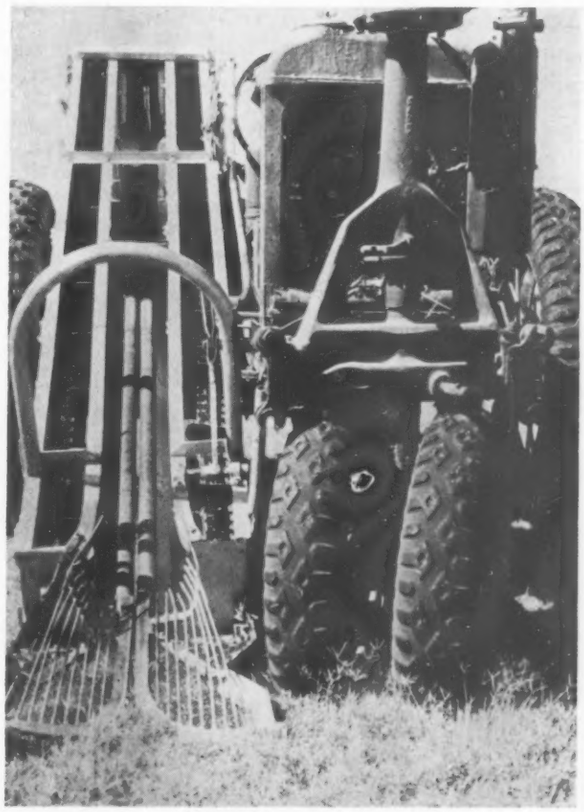
Oxyacetylene Welding Process for Cast Iron

■ *Welding of Cast Iron by the Oxyacetylene Process;* by L. Tibbenham; cloth; 88 pages, 5 x 7½ inches; published by Sir Isaac Pitman & Sons Ltd., London; available through STEEL, Cleveland, for $1.60.

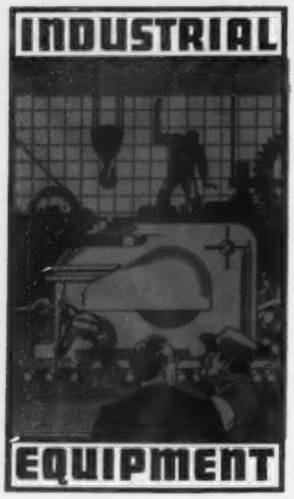
This book deals in a practical way with details of the process of welding cast iron by use of oxyacetylene. Written with the object of instructing the welder in this single process, no attempt has been made to describe any other method in use. The text is supplemented by some 45 illustrations and with a two-page double-column index. The work is presented under seven chapter headings. Chap. I deals with properties of cast iron; malleable iron; white iron; burnt iron; high tensile iron; nickel iron; grain growth; thermal expansion; internal cracks. Chap. II covers preheating methods; welding technique; causes of failure; angle of blowpipe; repairing castings from foundry viewpoint; reclamation of auto castings. Chap. III is devoted to gases; hydrogen; methane; coal gas; gasoline; acetylene; calcium carbide; acetylene types of flames; oxygen.

Chap. IV discusses low pressure; high pressure; generators, automatic, portable, American and continental; purifiers; back pressure valves; regulators; blowpipes; leftward and rightward technique. Chap. V takes up chemical analysis; various sections; silicon content; analysis of various cast irons; fluxes. Technique and welding procedure and applications of the process are described in Chap. VI. The final chapter is devoted to bronze welding, preparation of the weld, analysis of the rods, welding heat, method of welding; suitable flame; importance of flux and tinning; flux coated rods; high duty bronze welding rods.

Welded Construction Used in Cotton Harvester



■ Most of this stripper-type cotton harvester, built by Texas Agricultural Experiment station, College Station, Tex., is made of parts built up by welding and brazing angle and plate. Front view shows welded pick-up cradle which lifts low lying cotton bolls into the knurled steel stripping rolls immediately behind it. Photo courtesy International Acetylene association, 205 East Forty-second street, New York



Electric Bath Furnace

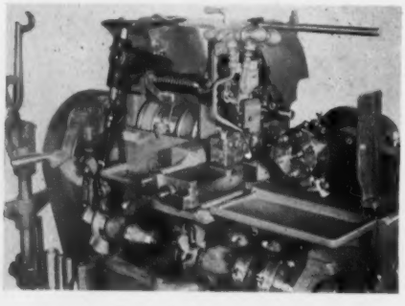
■ Commerce Pattern Foundry & Machine Co., 2211 Grand River avenue, Detroit, announces Upton electric salt bath furnace and control for practically any heat treating operation involving temperatures from 250 to 2500 degrees Fahr. Furnace operates on continuous electric current flow principle and has automatic control to vary current instantaneously to offset temperature fluctuations. It is claimed temperatures can be maintained up to 2500 degrees Fahr. with an accuracy within limits of pyrometric measurements.

Ceramic lining of pot is said to withstand temperatures in excess of those demanded by heat treating and to permit large power input to pot bottom, creating strong convection currents for distributing heat evenly throughout bath.

Turning Attachment

■ The longitudinal turning attachment of Brown & Sharpe Mfg. Co., Providence, R. I., for use on their Nos. 00 and 00G automatic screw, turret forming, cutting-off and screw threading machines (high speed) is a vertical slide attachment with longitudinal movement which will do straight turning to 1 inch in length. For turning behind a shoulder a swing tool is not needed. Turning is done independently of other operations and with spindle running in either direction.

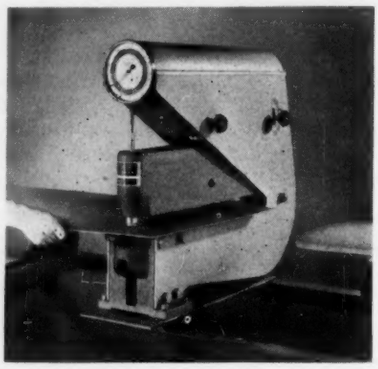
Vertical and longitudinal movements are both actuated by cams on cam shaft of the machine, each cam moving a bell crank, link and rack.



Vertical movement rack turns a shaft operating a pinion and rack in tool slide to produce vertical movements of slide. Other rack mechanism imparts longitudinal movement to a sleeve on vertical movement shaft and thus to tool slide assembly attached to end of sleeve. Spring acting on rear of vertical movement bell crank and another acting on longitudinal movement sleeve keep rollers on both bell cranks in contact with cams.

Mechanical Micrometer

■ Streeter-Amet Co., 4101 Ravenswood avenue, Chicago, announces the Guyer Gauger, a mechanical micrometer which clamps a sheet at any point the thickness is to be measured, holds long enough for operator to read the dial and then automatically releases the sheet. The cycle of clamping, gaging and releasing is constantly repeated, with frequency controlled by operator. Standard machine will indicate from 8 to 38 gage readings per min-



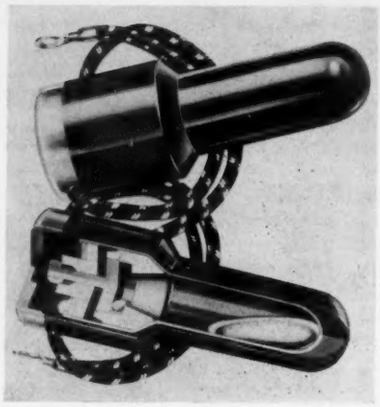
ute. Ranges of 9 to 42, 10 to 47 and 11 to 50 readings are also available.

Throat of machine is 23 inches deep clear of measuring anvil, permitting exploring of wide sheets for uniform thickness. Dial is graduated in 0.001-inch increments so any desired gage or tolerance may be readily established by means of adjustable dial rim markers.

Mercury Switch

■ A mercury switch, Durakool, with double reduction agents is announced by Durakool Inc., Elkhart, Ind. To a liquid fill has been added a hydrogen fill at 60 pounds pressure, providing a switch suitable for light or heavy-duty service from wall switching to motor starting and for continuous or intermittent operation. These switches are guaranteed for 3 years, are capable of operating on devices requiring 2400 contact breaks per minute and on induction motors up to 75 horsepower and 440 volts.

Switches are claimed to withstand temporary short circuits, to operate with least energy on smallest angles and to be safe in any explosive at-



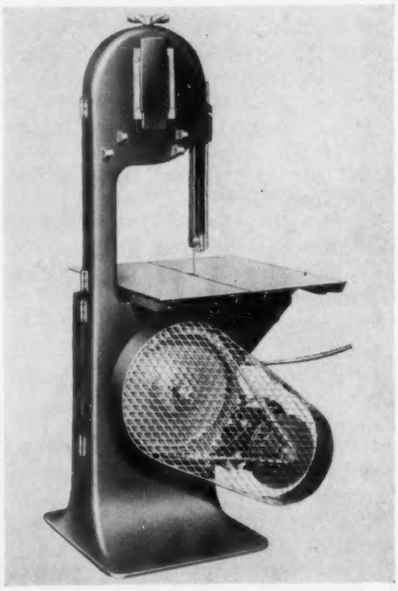
mosphere. The two reducing agents are further said to prevent deterioration of the mercury.

Due to use of flange making the electrode cup-shaped and smaller in diameter and allowing use of more insulating ceramic, same area of contact with mercury gives increased switch capacity for same physical size. An iron case protects the switch from shock, but a rubber or neoprene case is available for use under liquids. Temperature changes or operating conditions do not affect seal. Construction of inner ceramic and retained mercury pool provide quick make and break without false contact or chattering. Liquid fill also aids in quick make and break because of its oil-like stabilizing film. Contact is made over large area to minimize initial resistance.

Durakools are available in sizes from 1 to 200 amperes and up to 550 volts.

Metal Band Saw

■ Wells Mfg. Corp., Three Rivers, Mich., announces its No. 9 upright metal and wood cutting band saw having speeds of 60, 90, 250 and 500 feet per minute. Frame is of one-piece cast iron bolted to cast iron base 28 x 30 inches, which may be



bolted to floor. Grease sealed new departure ball bearings are used throughout. Reduction gears consist of one cast iron helical and one nonmetallic helical gear running in oil.

Wheels are cast iron and accommodate narrow blades for contour work as well as regular ½-inch wood or metal blades. Table is 26 x 28-inch heavy metal plate bolted through structural steel bars to base. Material can be cut up to capacity of frame opening. Blade is 0.025 x 0.5 x 113 inches. Throat is 11¾ inches deep and 15½ inches high.

Saw may be used in foundry on sprues and gates, in pattern shop as a wood saw, in die shop on die blocks and in sheet metal shop.

Industrial Rubber Tire

■ A new kind of industrial tire said to combine outstanding advantages of both pneumatic and solid types and to require no servicing is announced by B. F. Goodrich Co., Akron, O. Known as the Goodrich Silvertown cushion type tire, it is said to combine lightness, high cushioning qualities, streamlined appearance and low cost and the load-carrying capacity of a solid tire.

Available at present in two sizes—6 x 2.00 and 8 x 2.50—tire is suitable for operations which impose undue wear on conventional pneumatic types. Tire is interchangeable on same wheel with single-tube pneumatic tires of like sizes and at present is being adapted for light hand trucks, trailers and similar industrial vehicles.

Porous Bronze Retainer

■ Ball bearings incorporating retainers of oil-impregnated bronze, holding and slowly feeding sufficient oil to lubricate the bearing without leakage throughout its life, are announced by Fafnir Bearing Co., New Britain, Conn., for applications which are inaccessible or subject to subzero temperatures.

Porous structure of the strong, die-pressed bronze retainer holds 25 per cent of its volume of oil. In subzero applications where light grease will harden, these bearings are claimed to provide a minimum of drag—even less than conventional oil-lubricated bearings.

Marks Hot Metal

■ Helmer-Staley Inc., 331 West Huron street, Chicago, announces improved Paintcil, paint in stick form, for marking hot metals. Type W is claimed to be weatherproof and to remain on even after being submerged in acid pickler bath and after long periods of exposure to weather. Type S is removed by pickling process, thus eliminating possibility of being rolled into and consequently marring the surface in the cold reduction process. Markings made on hot metal with either type do not drip or discolor. Another type of Paintcil said to be unaffected by weather is furnished for marking cold metals.

Alloy for Contacts

■ P. R. Mallory & Co. Inc., Indianapolis, Ind., has developed 8CC metal, an alloy having one-tenth the contact resistance of copper for use in electrical contacts, particularly in heavy-duty electrical control equipment. This metal is said to create a de-ionizing action in the medium between arcing contact tips and to render contact faces self-cleaning with attendant arcing.

Alloy has nonfusing characteristics, electrical conductivity of 50 to 60 per cent of that of copper and hardness of 50 to 55 Rockwell B. It is free cutting and readily machinable but cannot be hot or cold worked and is supplied only in form of sand castings.

Fluorescent Fixture

■ Benjamin Electric Mfg. Co., Des Plaines, Ill., announces "Flur-O-

Expect—and *realize*—these two big gains when you install Elwell-Parker Power Industrial Trucks:—

1—New power—more-than-enough-power—behind your loads to keep them traveling at exactly the right speed from step to step in your manufacturing. Elwell-Parkers literally set the pace for your production.

2—Actual new earnings through reduced manufacturing costs, beginning the day you put them to work. These earnings increase as you find important new jobs for your Elwell-Parkers in linking operations between your processes or departments.

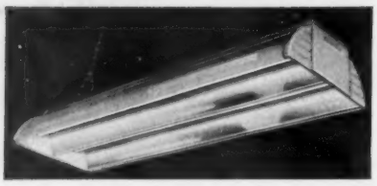
Your *rate* of savings will depend in large measure upon your literal acceptance of recommendations by Elwell-Parker Representatives who are fortified by our 33 years' experience building and applying Power Industrial Trucks, Tractors and Cranes *exclusively*.

For new low 1940 costs at *your* plant, write or WIRE COLLECT for a trained Elwell-Parker Representative who will call at once with information you can't afford *not* to have.

The Elwell-Parker Electric Company, 4501 St. Clair Ave., Cleveland, O.

ELWELL-PARKER *Power Industrial* TRUCKS

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906



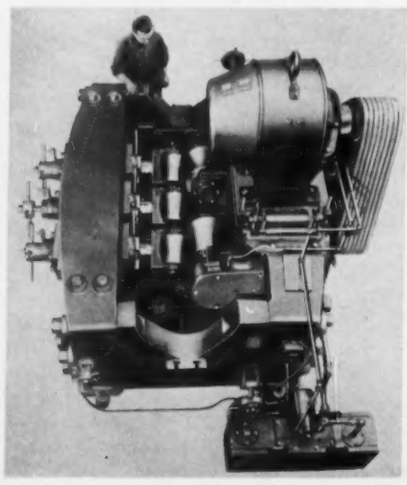
Liter" twin-lamp fluorescent fixture for the new 48-inch, 40-watt fluorescent white or daylight lamps. The highly polished, semi-concentrating Alzak aluminum double reflectors when mounted as closely as 3 feet over surface to be illuminated, provide 150 foot-candles of illumination of daylight quality without annoyance from heat. They are recommended for use over machines, inspection benches and production lines as well as for general lighting with high mounting.

Fixtures incorporate under one housing individual reflectors for each lamp, sockets complete with new type auxiliary, removable starting switches and line ballast equipment for regulating current to the lamps. "Tulamp" type ballasts used incorporate a capacitor in one lamp circuit for correction to about unity power factor and at the same time operate the two lamps far enough out of phase to reduce inherent alternating current "flicker" to the point where it is said no longer to be objectionable.

High-Speed Straightener

■ Sutton Engineering Co., Park building, Pittsburgh, announces its 2 BM machine for high-speed straightening of the production of continuous butt-weld mills. Straightening speed of machine using a 400 to 1600 revolutions-per-minute direct-current motor is 130 to 520 feet per minute. Machine has heat-treated spiral cut bevel gears fully enclosed running in oil and is equipped with Timken bearings throughout. All gear lubrication is made from a central station with lubrication gun incorporated in the panel.

Guides will not scratch and will

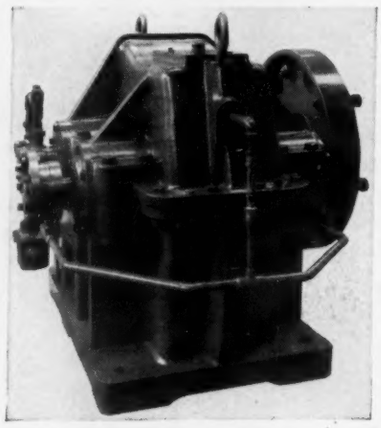


give long life. Pipe up to and including 3 inches in diameter can be straightened. The 2 B machine of similar design and purpose takes up to 4-inch pipe.

Speed Increasers

■ A new line of speed increasers for operating centrifugal pumps, high-speed blowers and compressors and for pipe-line service, has been announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Standard gear ratios vary from 2 to 1 to 12 to 1, and these units are available in ratings of from one horsepower for 1000 revolutions per minute of high-speed shaft to more than 1800 horsepower for 1000 revolutions per minute.

Speed increasers can be supplied for either right or left-hand assembly. Sleeve bearings provide low unit pressures and assure permanent alignment with minimum fric-

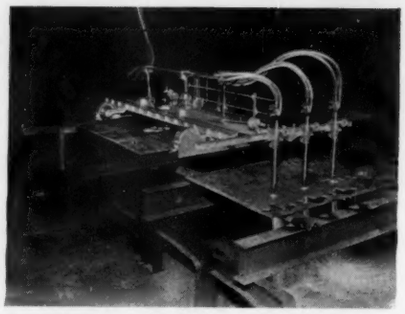


tion loss. Lubrication is by a self-contained circulating oil system, including a circulation pump, an oil cooler, strainer, relief valve and sight flow indicator. Gears are spray-lubricated at line of contact and all bearings are under pressure lubrication. Frames are split horizontally to permit easy access of all internal parts, and each unit has a removable inspection plate.

Oxyacetylene Cutter

■ A stationary oxyacetylene cutting machine for cutting irregular shapes, rings, circles and straight line bevels, and for performing several varieties of multiple blowpipe cutting is announced by The Linde Air Products Co., 30 East Forty-second street, New York.

This machine, known as the CM-23, will cut shapes either automatically with templets or guided by hand direct from a full scale drawing. It is available in two sizes, with cutting ranges of 54 and 81 inches in width by 12 feet in length. Maximum cutting area is slightly less when the machine is used for hand-tracing. Circles ranging in diameter from 6 to 49½ inches, for the smaller size machine, and 72



inches for the larger size can be cut. Both sizes of the CM-23 may be extended indefinitely longitudinally by the addition of 6-foot lengths of machine legs and rails and work support. In addition, machine can be supplied, on special order, with a transverse capacity of 108 or 135 inches.

Speed can be varied from 3¼ to 48½ inches per minute when templet-tracing and from 5½ to 82 inches when hand-tracing. The machine is equipped to accommodate a 3-hose cutting blowpipe of either low-pressure or medium-pressure type. Multiple blowpipe mountings on standard-sized models permit simultaneous operation of four blowpipes. Steel plate can be cut up to a thickness of 12 inches.

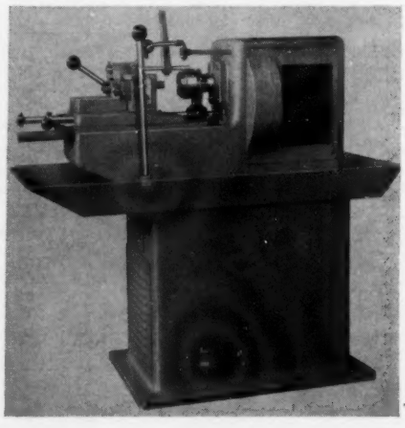
Acetylene Generator

■ The acetylene generator Oxweld MP-9 of The Linde Air Products Co., described in STEEL, Dec. 11, 1939, pages 67 and 70, is not mounted on any of the three trucks as stated, but is said to be readily moved about.

Threader Machine

■ The threading machine No. 16 of Geometric Tool Co., New Haven, Conn., performs precision threading for quantity production of duplicate parts and is claimed to feature accuracy, speed of production, rigidity and ease of operation.

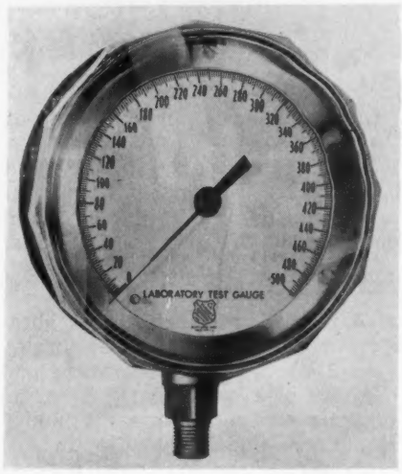
This machine has a quickly removable change gear cover, self-relieving reversing pump, vise-type chuck and platen-type carriage.



Maximum distance from vise to die head is 7½ and from collet to die head 9¾ inches. Maximum length of thread with vise is 5¾ inches. Using a 1-inch KD die head and vise equipped with automatic work gage, maximum length of thread with collet is 9 inches. Capacity with standard chuck jaw bushings is ¼ to 1¼ inches.

Checks Pressure Gages

■ A streamlined laboratory test gage developed by Ashcroft American Gage division of Manning, Maxwell & Moore Inc., Bridgeport, Conn., is claimed to check accuracy of pressure gages to within ¼ of 1 per cent of scale range.



Outer edge of dial is a mirror on which the tip of the pointer reflects if user is not in correct position to read gage accurately. Transparent molded plastic cover having a compression strength of 15,000 pounds per square inch opens up dial for easy reading.

Shovel and Dragline

■ Lima Locomotive Works Inc., Lima, O., offers its Type 1201 combination shovel and dragline adapted to quarries, strip mines, drainage work and heavy construction. Equipped as a standard shovel, it carries a 30-foot boom, 20-foot dipper handle and a 3-yard bucket. For special work such as open-pit mines, the machine can be equipped with a 42-foot beam, 32-foot dipper handle and a 2½-yard dipper. Shovel boom and dipper handle are box type design, electrically welded throughout.

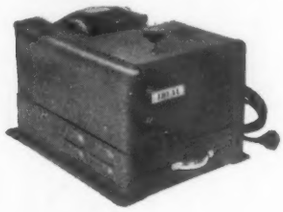
Only three levers and two foot pedals are necessary to control the three major operations—hoist, swing and crown. Hoist clutches are equipped with vacuum power assistors operating through toggles, which makes possible the lowering of load with clutch engaged.

Each major operation is independent of the other, making it possible to hoist, gravel, swing and raise or lower the boom simultaneously. Drums are 30 or more times the diameter of the cable used.

Wire Stripper

■ A new power-driven, brush-type wire stripper 9-C model, announced by Ideal Commutator Dresser Co., Sycamore, Ill., is said to be especially effective in cleaning fine "Litz" wires, in removing gummy insulation imbedded in stranded wires and in cleaning the new "Formex" magnet wire. It also cleans cotton and enamel, silk and enamel, string asbestos and other light insulations from round, flat or rectangular solid or stranded wire. A vacuum attachment draws insulation materials into a drawer in base, eliminating dust and dirt. Operation of stripper is by single, direct-belt drive from ¼-horsepower motor to special steel wire brushes.

Streamlined cover encloses stripper. Uniform length of stripping is assured by stop adjustment knob

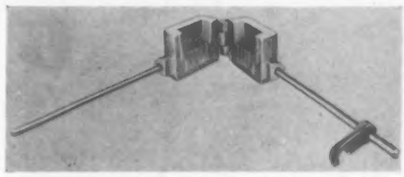


located on top of case. Brush clearance adjustment is made by large bakelite knob on top of case. Brushes are held apart against spring tension action, which allows assorted sizes of wires to be stripped without frequent adjustment of brushes and prevents stalling motor with oversize wire.

Metal Specimen Mold

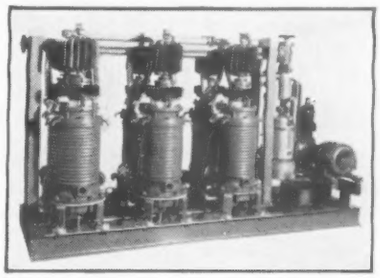
■ Harry W. Dietert Co., 9330 Roselawn avenue, Detroit, announces a heat resistant cast iron mold which forms four test specimens ⅛ x 1 inch of either ferrous or nonferrous metals in less than one minute. Two specimens may be used for spectroscopic analysis and the other two broken into pieces ¼-inch long and weighed for either carbon or sulphur determinations. These chill test pieces are claimed to burn more readily and form a more accurate sample than borings.

Considerable time and work are said to be eliminated, especially in the case of hard irons which ordinarily must be annealed prior to attempting to drill the sample or which otherwise must be crushed to suitable size.



Power Rectifier

■ Allis-Chalmers Mfg. Co., 1126 South Seventieth street, Milwaukee, has developed "Excitron," a single-anode power rectifier said to be particularly suited for applications where amount of available head room is limited. Instead of having all anodes in one vacuum chamber, this rectifier consists of factory-assembled groups of relatively small vacuum tanks, each containing a single anode and its individual cathode. Tanks, which are externally cooled by water, are generally mounted in groups of six on a heavy structural steel frame.



Due to closer spacing between an anode and its associated cathode than in multi-anode type of rectifier, voltage drop in mercury arc is reduced. Efficiency of this model is claimed to be from 3 to 4 per cent higher in the lower voltage brackets, this advantage being particularly pronounced at 250 to 300 volts. Rectifier is operated by simple arc ignition and control devices.

Engine-Driven Welder

■ A Junior type 200-ampere, engine-driven, arc welder known as the "SAE-200 J" featuring light weight, small size and low cost is announced by Lincoln Electric Co., 12818 Coit road, Cleveland. Weighing under 900 pounds, it can be wheeled readily by one man or lifted by its single balancing hook.

Generator is of single-operator, variable-voltage type with laminated pole pieces to increase arc stability and simplify welding. Current range, welding duty, is 40 amperes to 250 amperes for bare, washed or heavily coated electrode. Class B insulation is used in armature. Con-

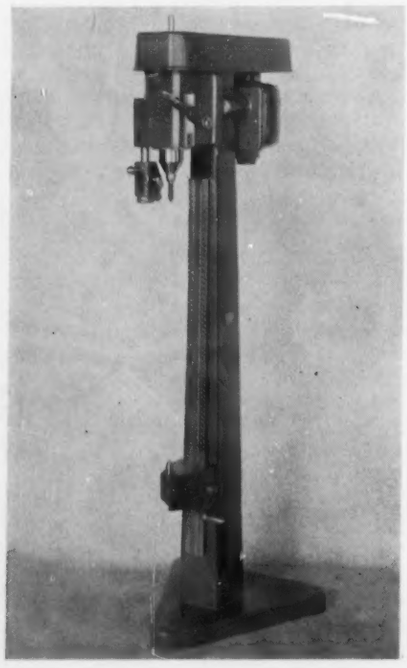
tinuous voltage control, (job selector) and current control make it easy to select any type of arc.

Gasoline engine is 4-cylinder type, having 3-inch bore and 4-inch stroke with piston displacement of 113 cubic inches, capable of delivering 26 horsepower at 1800 revolutions per minute. Pressed steel canopy covers machine. Price is $450.

Center Lapping Machine

■ Ex-Cell-O Corp., 1200 Oakman boulevard, Detroit, offers its improved center lapping machine for quick and inexpensive lapping of female centers in parts held between centers and ground on the outside diameter. Part to be lapped is placed on a vertically adjustable work rest and held by hand while a lapping stone is brought down by a hand lever. Work rest is prevented from dropping by a cam, and is locked in position by a hand crank. Lapping stone is mounted on an Ex-Cell-O precision ball-bearing spindle.

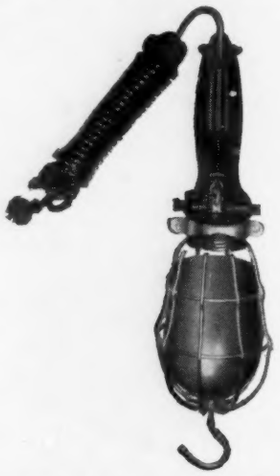
Four-step pulleys on spindle and electric driving motor give lapping speeds of 700, 1300, 2500 and 4650 revolutions per minute. Machine laps centers up to 15/16-inch diameter in work up to 10 inches in diameter 36 inches long. With a special column, work up to 84 inches long can be lapped.



Lapping stone dresser can be swung in or out of position. Dresser diamond is passed at a 60-degree angle across stone by a rack and pinion. Gear ratio produces a slow, smooth crossing stroke and consequently a better cutting surface on the stone. Adjustment on dresser allows compensation for wear of lapping stone.

Electric Trouble Set

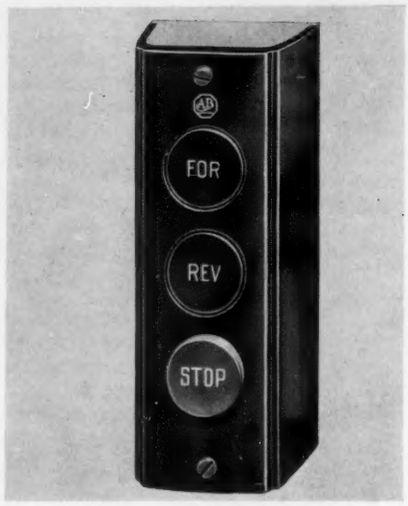
■ Royal Electric Co. Inc., Pawtucket, R. I., introduces flexible Sealed Tight trouble set with 1-piece rubber handle. There are no seams or side holes to let in oil, water or dirt. Interior mechanism is completely enclosed, fully protected by rubber and shock-proof. Nonskid grip makes set easy to handle and keep clean. Cushion mounting of lamp guard increases lamp life by preventing jolts from reaching the lamp. Sets are equipped with nonkinking heavy-duty rubber covered wire, all-rubber plug with spring action blades for good electrical contact and heavy-duty guard with suspension hook and reflector.



Control Station

■ Three-button, Bulletin 800, control station offered by Allen-Bradley Co., 1311 South First street, Milwaukee, is of unit-type construction mounted in a die-cast box which is open at front and two sides and has a conduit opening at one end. With cover off, all terminals are out in open, allowing easy installation and inspection.

Cover is furnished in black as standard, but may be provided in machine-tool gray or white. Button markings available include "Forward-Reverse-Stop", "Raise-Lower-Stop", "Up-Down-Stop" and "Open-Close Stop". Bar for locking "Stop" button in open position is available.



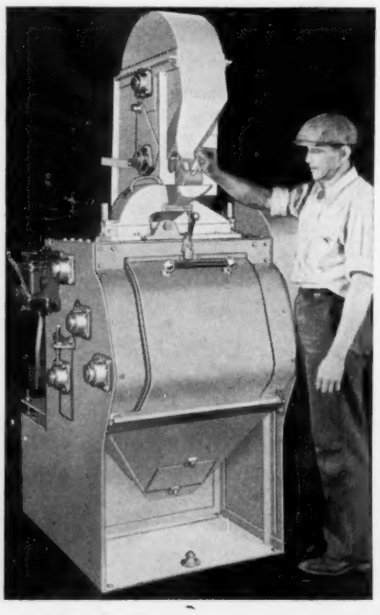
Maximum direct-current rating of these control stations is 1 ampere, 115 volts; 0.5-ampere, 230 volts; and 0.25-ampere, 550 volts. Maximum alternating-current rating is 3 amperes at 110, 220, 440 and 550 volts.

Airless Abrasive Mill

■ A new 15 x 20-inch airless abrasive blasting mill, Wheelabrator Tum-Blast, having an operating load capacity of 1 cubic foot is now being marketed by American Foundry Equipment Co., Mishawaka, Ind.

This machine operates without compressed air by using Wheelabrator centrifugal abrasive blasting unit which throws metallic abrasive upon the work being cleaned or prepared. As in the larger size Tum-Blasts, cleaning chamber is formed by endless apron conveyor made of abrasion resisting rubber. Movement of conveyor tumbles and cascades work directly beneath blasting unit so entire load is completely exposed to full effect of blast.

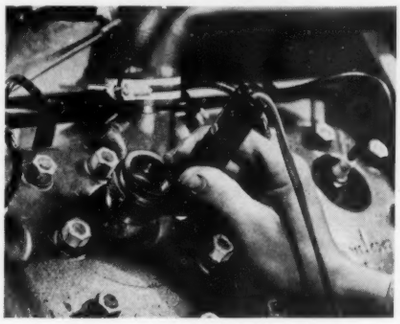
After striking load, abrasive falls



through perforations in conveyor to hopper connecting with bucket elevator which picks up abrasive and carries it to an overhead abrasive separator and storage hopper from which it feeds by gravity to unit for reuse. One 3-horsepower electric motor provides power for all operating units, including Wheelabrator, abrasive elevator and mill drive.

Illuminated Magnifier

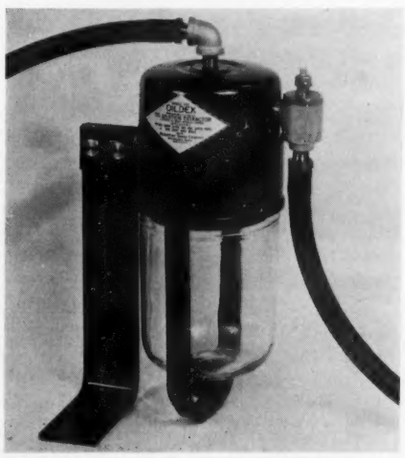
■ E. W. Pike & Co., Elizabeth, N. J., have devised the Pike-O-Scope, an illuminated magnifier for examining inside portion of valves, valve



seats and other types of machinery. A set of achromatic triple lenses is lighted by a lamp built into the bottom of a cylinder which also serves as a handle. Instrument may be attached to electric outlet or used with dry cell batteries. Lamp cylinder and threaded ring for the lenses are made of a heavy, shock-resistant bakelite molded. Full illumination is given and defects can readily be seen at a distance of two feet from the eye.

Oil Dilution Extractor

■ Improvement of its oil dilution extractor, Oildex, in which dilution extraction and filtration are accomplished and of its oil filter, Filtrex, is announced by Bridgeport Brass Co., Bridgeport, Conn. Use of these two devices is said to have shown, besides oil savings, consistent gasoline savings of from 5 to 20 per



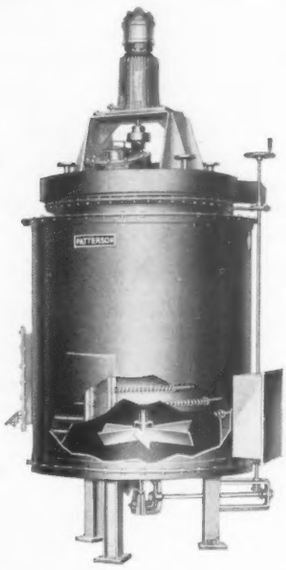
cent, depending on the condition of the motor when the installation is made, and reduction in motor maintenance cost by as much as 50 per cent. Special attention is being devoted to developing the oil dilution extractor for tractors and diesel engines.

Electric Kettles

■ Patterson Foundry & Machine Co., East Liverpool, O., has put on the market a line of electric process kettles equipped with Patterson "Flasheat" electric heating elements. More rapid heat-up, more heat concentration per unit area and higher efficiency are claimed for these kettles.

Immediate replacement of the elements, adjustments and repairs can be made without removal of the insulating jacket from the kettle. Quick water cooling coupled with more rapid heat-up makes possible a much shorter processing cycle than is possible with other types of kettles.

Kettles are built in plain and



stainless steel as well as in a variety of nonferrous metals. They are available in a wide range of sizes and are fitted with various types of mixing apparatus.

Multibreaker

■ Production of a new 2-pole, 100-ampere frame, type M2 MultibreakeR is announced by Square D Co., 6060 Rivard street, Detroit. Breaker is of common trip type, overload on one pole automatically tripping both poles simultaneously, and is suitable for: 3-wire solid neutral, 115 to 230 volts, alternating current, insulated groundable neutral; 2-pole, 115 to 230 volts, alternating current, no neutral; capacities of 50, 70, 90 or 100 amperes.

Breaker is trip free and cannot be held closed on a short circuit or overload. Indicating handle shows

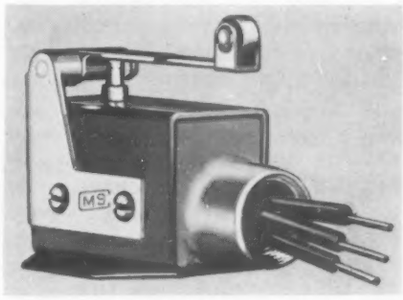
clearly whether breaker is on, off or tripped. Breakers are available for flush or surface mounting and are said to be tamperproof, factory calibrated and sealed so intended and proper capacity cannot be exceeded. They are tested and listed by Underwriters' Laboratories Inc. List price is $16.50 for 2-pole solid neutral device illustrated.

Washable Sweatband

■ Amercian Optical Co., Southbridge, Mass., announces a new inexpensive sweatband to be worn across the forehead. Made of synthetic sponge, the band absorbs sweat and can be used again after washing. Dimensions are 6¾ x 1¾ inches. Equipped with elastic headband and buckle, sweatband can be adjusted to fit any forehead.

Switch Actuator

■ Micro Switch Corp., Freeport, Ill., announces its Type J complete roller lever actuator to be used with regular and metal-clad switches. Mounting holes on actuator coincide with those on switch. Lower arm rides on oilless bronze bearing which rests on plunger of switch. Case-hardening roller with oilless bronze bearing is mounted on end of lever arm. Operating ratio is 8 to 1—an 0.008-inch movement at end of lever arm moves switch plunger 0.001-inch. Minor adjustments can be made by slightly bending lever arm.



Census To Begin Jan. 1 Will Show Major Markets For Steel

WASHINGTON

■ ACTIVE work will begin Jan. 1 on census. Preparations have been under way for some months.

First census was taken in 1790 which was merely a count of the population. New census will cover 132,000,000 people; 170,000 manufacturers, with 1000 iron and nonferrous ore mines, and industrial establishments of all kinds. The first census of manufacturers was taken in 1810.

This 1940 census will include, in addition to the population census, the censuses of manufactures and business, mines and quarries, agriculture, drainage and irrigation, and a census of housing which will be taken for the first time. There also will be the usual monthly reports on iron and steel products, transportation equipment and other products of the steel-consuming industries.

That first enumeration of manufactures lists the products of a few of the original component parts of the present-day iron and steel industry, "bar iron," tin plate, the output of the "rolling and slitting" mills, as well as "labor-saving machinery" for the then young textile industry. For 1937, the census of manufactures records the value of products of the steelworks and rolling mills at well over $3,250,000,000; of blast furnaces at over $672,000,000, and of iron and steel forgings at nearly $123,000,000.

Production Gains Noted

The 1937 production of steelworks and rolling mills was 72 per cent higher than in 1935 and 191 per cent higher than in 1933. Blast furnace production, that year, increased during the same periods, 79.5 and 214.7 per cent, and iron and steel forgings, 85.1 and 277.7 per cent. Production of machine tools was valued, in 1937, at more than $260,000,000 and of precision tools and accessories, over $162,000,000. The gain in production for that year of these two industries was respectively 113.6 and 67.1 per cent; and their gain over 1933, 528.1 and 246.3 per cent.

The new enumeration will record not only the tonnage and value of products, the cost of manufacture, materials and labor, but the number, capacity and value of prime movers and generators, the cost of electric energy and fuel, as well as data never before made available on the expenditures during the year for new machinery, plant expansion and alterations.

The 1939 figures will show the consumption of the major markets for steel. Statistics will be tabulated, for example, on the tonnage of flat rolled steel which finds its greatest market in the automobile industry; on the production of structural steel, rails and rail joints, and tin plates which is largely consumed by the can manufacturers. The tonnage consumed by the new and growing markets, new business as a result of new uses for steel, also will be given.

Statistics also will be compiled on the consumption in the mills themselves of materials produced, and further fabricated or processed within the same plants. Production officials will want to compare these figures with those for 1937. They also will want to compare their own company's figures with those of the average steel works. They will be interested, too, in the data on the amount of work transferred from one plant to another.

Will Help Gage Future Business

The figures on tonnage and the cost of manufacture will be valuable as a measure of operating efficiency. The expenditures for new machinery by the buyers of this equipment will provide machinery builders with an index of the volume and trend of business in 1939. This data, used in conjunction with the sales figures itemized in the census of business, will give a fairly complete picture of market activities in this line, which can be used to gage future business.

The figures on materials used by the steel consuming industries will be extended in the 1939 compilation to cover industries previously omitted from this tabulation. Figures will be tabulated, for example, on the materials used by the hardware industry, boiler shops, the producers of hand tools, structural fabricated products, and even saws and files.

Statistics on the sales of manufactures will be made available, for the first time since 1935, in the census of business. These figures will be broken down by types of products and will show the value of products sold in 1939 through each distribution channel. There will also be data showing changes in ownership and stability of retail establishments, figures on consumer debts, outstanding accounts and inventories.

This census will record the value of contracts for heavy construction, classified separately from residential and other light construction. It will show not only the value of contracts completed but the value of contracts received during the year.

The agriculture census, coupled with the data on the makers of farming implements, will be a useful index to the extent of mechanization on the farms and the potentialities of this market.

Some 12,000 census takers will be in the field in January calling on manufacturers and distributors. They will be followed in April by 120,000 additional enumerators who will collect the balance of the information for the other census reports. All field work in the census taking job will be completed, it is anticipated, by May.

Facts Available by Early Fall

Census takers in the censuses of business and manufactures will deliver schedules to each reporting firm, in person, and will call for them after they have been filled out. At least the basic facts of each industry and trade will be published by late summer or early fall, to be followed as rapidly as possible by more detailed reports.

The same law which requires reporting to the census bureau protects those giving the answers by prohibiting disclosure, even to any other government agency, of the names of persons or companies, or of any facts about individual establishments. The data will be used only in broad statistical form. Assurance is thus given that the reports will not be used for purposes of taxation, regulation or investigation.

Refrigeration Standards

■ "Equipment Standards Supplement 'A'" is published by Refrigerating Machinery association to supplement "Equipment Standards" published in 1938. Its contents include: Base specifications for self-contained ammonia units; ammonia brine cooler ratings; Freon-12 mains showing tonnage allowances for various line sizes and operating conditions in Freon-12 suction, discharge and liquid lines; and standard nomenclature for reciprocating compressors. Copies are available from Refrigerating Machinery association offices, Southern building, Washington, at 25 cents.

Markets Respond to Seasonal Influences

Decline in Steelmaking Smaller Than Usual; Backlogs Heavy

MARKET IN TABLOID ★

Demand
Lighter, still active for this period.

Prices
Steady; scrap remains easy.

Production
Dropped 2 points to 90½ per cent.

■ EFFECTS of the season were more apparent in steel markets last week, but neither specifications nor production moderated to the extent that is common for the pre-holiday period.

Steel ingot production declined 2 points to 90½ per cent, down 3½ points from the fall peak. A year ago, operations slipped 6 points to 52 per cent. Christmas day observance will cause a sharper reduction this week, but prompt recovery is indicated after the holidays.

Orders have shrunk further. This is a reflection of not only seasonal factors but also the extensive forward buying of recent weeks which will fortify steelmaking during the approaching quarter. Backlogs are declining, but producers will carry over sufficient tonnage into 1940 to assure relatively brisk operations through at least the first half of next period.

Unfilled orders in a number of products will absorb output into February, in a few cases through March. However, there are indications the industry has seen the peak in operations for the present and will be less crowded next quarter in meeting delivery requirements.

Steel consumption in many industries is sustained better than usual for late December, and this is preventing creation of unwieldy inventories. Prospects for a pickup in new buying after the turn of the year are made somewhat indefinite by the extent of forward orders already on producers' books. Should deliveries continue to improve and stable prices continue in sight, buyers will be less disposed to contract far ahead.

Heavier export business in steel products is seen for early 1940, but the recovery is thought likely to be moderate. Nothing approaching the peak volume of the 1914-1918 period is in early prospect. Expected heavy bookings of war material by Canada may require sizable steel purchases in the United States to supplement Canadian capacity. The outlook for tin plate exports has been dimmed somewhat by the fact British mills have been able to retain a large part of their world markets despite the war.

Tin plate production slackened to 85 per cent last week. Reaffirmation of prices for first quarter has been a factor in lessening delivery pressure.

Automobile assemblies continue brisk. Retail sales, although declining, have held dealer stocks to subnormal levels, a situation in which the Chrysler strike also was a contributing factor. Output last week totaled 117,705 units, practically unchanged from the preceding week and comparing with 92,890 cars and trucks a year ago. The holiday will cause some curtailment this week, but production of close to 1,200,000 units is in sight for first quarter.

Several large awards offset the generally slower trend in structural shape activity. Outstanding orders are 9000 tons for ten navy hangars and 3245 tons for the Continental Divide tunnel in Colorado. Shape producers and fabricators are working off backlogs, and unfilled business in concrete reinforcing bars also is declining.

Railroads are marking time in equipment purchases, still having a large number of freight cars due against previous orders. Car buying this year will total close to 60,000 units, three-fourths of which has been placed since August. This compares with 16,303 cars bought in 1938 and 51,611 in 1937.

Manganese ore prices are off slightly on the basis of recent bids to the government. Tungsten ore quotations also are lower.

Iron and steel scrap markets continue quiet, and while prices are steadier in some districts, a reversal in the downward trend of the past ten weeks has yet to appear. A further reduction at Chicago has dropped the composite 17 cents to $17.58. The finished steel price composite holds at $56.10, compared with $56.50 a year ago.

Operations declined in most steelmaking districts last week. One exception was the Cincinnati area where completion of equipment repairs brought a recovery of 13 points to 82 per cent. Sharpest reduction was 10½ points to 79½ at Buffalo. Other losses were 2 points to 91 at Pittsburgh, ½ point to 92 at Chicago, 3 points to 85 in eastern Pennsylvania, 2½ points to 87½ at Cleveland, 4 points to 89 in New England, 2 points to 91 at Youngstown, 8 points to 77 at St. Louis and 4 points to 90 at Detroit. Birmingham continued at 94, and Wheeling was unchanged at 85.

COMPOSITE MARKET AVERAGES

	Dec. 23	Dec. 16	Dec. 9	One Month Ago Nov., 1939	Three Months Ago Sept., 1939	One Year Ago Dec., 1938	Five Years Ago Dec., 1934
Iron and Steel	$37.10	$37.19	$37.26	$37.50	$36.67	$36.36	$32.39
Finished Steel	56.10	56.10	56.10	55.90	55.60	56.50	54.00
Steelworks Scrap..	17.58	17.75	18.00	20.06	17.97	14.77	11.02

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Dec. 23, 1939	Nov. 1939	Sept. 1939	Dec. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.15	2.15	2.125	2.05
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.00	2.00	2.00
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.40	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago.	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to 9/32-inch, Pitts.	2.00	1.92	1.92	1.92

Pig Iron

	Dec. 23, 1939	Nov. 1939	Sept. 1939	Dec. 1938
Bessemer, del. Pittsburgh	$24.34	$24.34	$23.35	$22.34
Basic, Valley	22.50	22.50	21.50	20.50
Basic, eastern, del. Philadelphia	24.34	24.34	23.54	22.34
No. 2 foundry, Pittsburgh	24.21	24.21	23.20	22.21
No. 2 foundry, Chicago	23.00	23.00	23.00	22.20
Southern No. 2, Birmingham	19.38	19.38	18.58	17.38
Southern No. 2, del. Cincinnati	22.89	22.89	22.09	20.89
No. 2X, del. Phila. (differ. av.)	25.215	25.215	24.415	23.215
Malleable, Valley	23.00	23.00	22.00	21.00
Malleable, Chicago	23.00	23.00	23.00	22.50
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	29.84
Gray forge, del. Pittsburgh	23.17	23.17	22.15	21.17
Ferromanganese, del. Pittsburgh	105.33	105.33	95.35	97.77

Scrap

Heavy melting steel, Pittsburgh	$18.00	$21.90	$18.75	$15.50
Heavy melt. steel, No. 2, E. Pa.	17.25	19.25	17.10	13.20
Heavy melting steel, Chicago	16.25	17.45	19.25	16.05
Rails for rolling, Chicago	19.75	20.50	21.90	19.65
Railroad steel specialties, Chicago	18.50	21.50	21.75	18.00

Coke

Connellsville, furnace, ovens	$4.75	$5.00	$3.75	$3.75
Connellsville, foundry, ovens	5.75	6.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	11.25	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast points	2.60c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.35c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 20 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(Base, 5 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Detroit, delivered	2.25c
Cleveland	2.15c

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast points	2.75c

Iron

Chicago, Terre Haute	2.15c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

**Subject to a deduction of 25 cents per 100 lbs. in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails	$2.55
(Per pound)	
Polished fence staples	2.55c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.88; two-point cattle, 80-rod spool	$2.70
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	67.00
Single loop bale tie, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh $3.70

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast points	2.70c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, for full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller	70.0 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific coast ports	2.90c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼ "O.D.	13	9.26	10.67
1½ "O.D.	13	10.23	11.79
1¾ "O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼ "O.D.	13	14.54	16.76
2¼ "O.D.	12	16.01	18.45
2½ "O.D.	12	17.54	20.21
2¾ "O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½ "O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½ "O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl. (per 100 lbs.)	$2.00
Do., over ⅜ to 47/64-in. incl.	2.15

Worcester up $0.10; Galveston up $0.25; Pacific Coast up $0.45.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.75- 5.25
Connellsville, fdry.	5.50- 6.00
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	.....	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.39
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	24.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
St. Louis from Birmingham	†23.12	....	22.62	....
St. Paul from Duluth	25.63	25.63	....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00-$26.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	22.00
Do. barge	22.00
No. 2 lump	22.00

Ferroalloy Prices

Ferromanganese, 78-82%, tide., duty pd. $100.00; Do., del. Pitts., 105.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 32.00; Do., 26-28% 39.50

Ferrosilicon, 50% freight allowed, c.l. 69.50; Do., ton lot 80.50; Do., 75 per cent 126.00; Spot, $5 a ton higher.

Silicomanganese, 2½ c. 103.00 2% carbon, 108.00; 1%, 118.00 Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 2.00-2.10

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c; Do., ton lots 11.25c; Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c; Do., ton lots 17.25c; Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.75c
1% carb.	17.50c	18.25c	18.75c
0.10% carb.	19.50c	20.25c	20.75c
0.20% carb.	18.50c	19.25c	19.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots 1.23; Do., less-ton lots 1.25

20-25% carbon, 0.10 max., ton lots, lb. 1.35; Do, less-ton lots 1.40

Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls 2.25; Do., less-ton lots 2.30

Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton 142.50; Do, spot 145.00; Do, contract, ton lots 145.00; Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50; Do, spot 160.00; Do, contract, ton lots 160.00; Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c; Do, ton lots 8.00c; Do, less-ton lots 8.50c

Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c; Do, spot carlots, bulk 7.50c; Do, ton lots 8.00c; Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. 2.50; Do., smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained 1.10; Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c; Do, spot 85.00c

88% chrome, contract 79.00c; Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c; Do., 2% 12.50c

Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50; Carload, spot 74.50; Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c; Ton lots 5.50c; Less-ton lots 5.75c

Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50; Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c; Do, ton lots 15.00c; Do, less-ton lots 16.00c

Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60; Do, 100-200 lb. lots 2.75; Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.86	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.23	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.85	4.35	3.55	3.55	5.25	3.55	4.55	4.93	3.51	4.06	8.56	7.16
Baltimore	3.95	4.05	4.45	3.70	3.70	5.25	3.55	....	5.05	....	4.05	....	....
Norfolk, Va.	4.15	4.25	....	3.90	3.90	5.45	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	6.40	4.20	4.40	4.50	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.75	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.72	3.20	3.75	8.15	6.75
Detroit	3.58	3.68	3.68	3.75	3.80	5.42	3.43	4.50	4.84	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.67	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.85	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	5.00	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.98	3.54	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.95	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.68	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	....	5.71	....	4.69	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
*Seattle	4.00	3.85	5.20	3.40	3.50	5.75	3.70	6.50	4.75	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.65	6.45	4.00	4.00	6.40	4.30	6.50	5.25	....	6.60	10.65	9.80
San Francisco	4.00	4.45	6.00	4.00	4.00	5.60	3.85	6.40	5.15	....	6.80	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.10	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.63	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 0-1499 pounds in New York, 150-1499 pounds in Cleveland, Milwaukee, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, St. Louis, Tulsa; 1500 and over in Chattanooga, Philadelphia; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 or 2000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Dec. 21

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports: £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons: **Quoted in gold pounds sterling: £ s d
Foundry, 2.50-3.00 Si.	$23.64 6 0 0	$28.97	3 8 0
Basic bessemer	....	19.59	2 6 0
Hematite, Phos. .03-.05	24.63 6 5 0	.....	.....
Billets	$29.06 7 7 6	$31.95	3 15 0
Wire rods, No. 5 gage	44.82 11 7 6	60.71	7 2 6
Standard rails	$37.43 9 10 0	$48.99	5 15 0
Merchant bars	2.16c 12 5 0	2.90c	7 12 6
Structural shapes	1.96c 11 2 6	2.81c	7 8 0
Plates, ††¼ in. or 5 mm.	1.93c 10 18 9	3.52c	9 5 0
Sheets, black, 24 gage or 0.5 mm.	2.75c 15 12 6	3.52c	9 5 0°
Sheets, gal., 24 ga., corr.	3.19c 18 2 6	4.56c	12 0 0
Bands and strips	2.16c 12 5 0	2.76c	7 5 0
Plain wire, base	3.43c 19 10 0	3.04c	8 0 0
Galvanized wire, base	4.09c 23 5 0	3.61c to 3.66c	9 10 0 to 9 12 6
Wire nails, base	....	3.52c	9 5 0
Tin plate, box 108 lbs.	$ 6.21 1 11 6	.....	.....

British ferromanganese $100.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich §§Mark
Fdy. pig iron, Si. 2.5	$21.28	5 8 0(a)	$15.21	679.30	$24.14	725	$25.33	63
Basic bess. pig iron	20.00	5 1 6(a)	.....	.....	.....	...	27.94	(b)69.50
Furnace coke	5.76	1 9 2	5.04	225	10.32	310	7.64	19
Billets	33.00	8 7 6	25.36	1,132	28.38	860	38.79	96.50
Standard rails	1.79c	10 3 0	1.41c	1,405	2.06c	1,375	2.38c	132
Merchant bars	2.25c	12 16 0††	1.43c	1,434	1.88c	1,250	1.98c	110
Structural shapes	2.01c	11 8 0††	1.40c	1,395	1.88c	1,250	1.93c	107
Plates, ††¼-in. or 5 mm.	2.03c	11 10 6††	1.82c	1,815	2.21c	1,475	2.29c	127
Sheets, black	2.84c	16 2 6§	2.15c	2,154‡	2.70c	1,800‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.28c	18 12 6	2.85c	2,850	4.58c	3,050	6.66c	370
Plain wire	3.17c	18 0 0	2.00c	2,000	3.00c	2,000	3.11c	173
Bands and strips	2.38c	13 11 0††	1.59c	1,588	2.40c	1,450	2.29c	127

†British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	16.50-17.00
Bos. dock No. 1 exp.	16.00-16.50
New Eng. del. No. 1	16.50
Buffalo, No. 1	17.00-17.50
Buffalo, No. 2	15.00-15.50
Chicago, No. 1	16.00-16.50
Chicago, auto, no alloy	15.00-15.50
Chicago, No. 2 auto	13.00-13.50
Cincinnati dealers	14.00-14.50
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	†13.00-13.50
Detroit, No. 2	†12.00-12.50
Eastern Pa., No. 1	18.50-19.00
Eastern Pa., No. 2	17.00-17.50
Federal, Ill.	14.50-15.00
Granite City, R. R.	15.50-16.00
Granite City, No. 2	14.00-14.50
Los Angeles, No. 1	16.50-17.00
Los Angeles, No. 2	15.50-16.00
L. A., No. 1 f.a.s.	18.50-19.50
L. A., No. 2 f.a.s	17.50-18.50
N. Y. dock No. 1 exp.	14.50
Pitts., No. 1 (R. R.)	19.50-20.00
Pittsburgh, No. 1	17.50-18.50
Pittsburgh, No. 2	16.50-17.00
St. Louis, R. R.	16.00-16.50
St. Louis, No. 2	14.00-14.50
San Francisco, No. 1	16.50-17.00
San Francisco, No. 2	15.50-16.00
Seattle, No. 1	14.50-15.50
Toronto, dlrs., No. 1	10.75-11.25
Valleys, No. 1	18.50-19.00

COMPRESSED SHEETS

Buffalo, new	15.00-15.50
Chicago, factory	15.50-16.00
Chicago, dealers	14.00-14.50
Cincinnati, dealers	13.50-14.00
Cleveland	17.00-17.50
Detroit	†13.75-14.25
E. Pa., new mat.	18.50-19.00
E. Pa., old mat.	16.00-16.50
Los Angeles	12.00-12.50
Pittsburgh	17.50-18.50
St. Louis	11.50-12.00
San Francisco	14.00-14.50
Valleys	18.00-18.50

BUNDLED SHEETS

Buffalo, No. 1	15.00-15.50
Buffalo, No. 2	13.00-13.50
Cleveland	13.50-14.00
Pittsburgh	16.50-17.50
St. Louis	10.00-10.50
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	10.50-11.00
Cincinnati dealers	9.50-10.00
Detroit	†9.50-10.00
St. Louis	9.50-10.00
Toronto, dealers	6.75- 7.00

BUSHELING

Birmingham, No. 1	14.00
Buffalo, No. 1	15.00-15.50
Chicago, No. 1	15.00-15.50
Cincin., No. 1, deal.	11.50-12.00
Cincinnati, No. 2	5.00- 5.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1, new	†12.50-13.00
Valleys, new, No. 1	18.00-18.50
Toronto, dealers	5.00- 5.50

MACHINE TURNINGS (Long)

Birmingham	6.00
Buffalo	10.00-10.50
Chicago	10.00-10.50
Cincinnati, dealers	6.50- 7.00
Cleveland, no alloy	11.00-11.50
Detroit	†7.50- 8.00
Eastern Pa.	12.50-13.00
Los Angeles	4.00- 5.00
New York	†7.00- 7.25
Pittsburgh	13.00-13.50
St. Louis	7.00- 7.50
San Francisco	5.00
Toronto, dealers	6.00- 6.25
Valleys	12.00-12.50

SHOVELING TURNINGS

Buffalo	13.50-14.00
Cleveland	12.00-12.50
Chicago	10.00-10.50
Chicago, spcl, anal.	12.50-13.00
Detroit	†9.50-10.00
Pitts., alloy-free	14.50-15.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston district	†6.00- 6.25
Buffalo	11.00-11.50
Cincinnati, dealers	5.00- 5.50
Cleveland	12.00-12.50
Eastern Pa.	11.50-12.00
Detroit	†7.50- 8.00
New York	†7.00- 7.50
Pittsburgh	12.00-12.50
Toronto, dealers	5.50- 6.00

AXLE TURNINGS

Buffalo	17.00-17.50
Boston district	†9.50-10.00
Chicago, elec. fur.	16.00-16.50
East. Pa. elec. fur.	17.50-18.00
St. Louis	10.50-11.00
Toronto	6.00- 6.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.50- 9.75
Buffalo	11.00-11.50
Chicago	9.00- 9.50
Cincinnati, dealers	5.00- 5.50
Cleveland	12.00-12.50
Detroit	†7.50- 8.00
E. Pa., chemical	14.50-15.00
New York	†7.00- 7.50
St. Louis	6.00- 6.50
Toronto, dealers	5.50- 5.75

RAILROAD SPECIALTIES

Chicago	18.25-18.75

ANGLE BARS—STEEL

Chicago	18.50-19.00
St. Louis	16.00-16.50

SPRINGS

Buffalo	22.00-22.50
Chicago, coil	19.50-20.00
Chicago, leaf	17.50-18.00
Eastern Pa.	24.00
Pittsburgh	23.00-23.50
St. Louis	19.00-19.50

STEEL RAILS, SHORT

Birmingham	17.50-18.00
Buffalo	22.00-22.50
Chicago (3 ft.)	19.00-19.50
Chicago (2 ft.)	19.50-20.00
Cincinnati, dealers	20.50-21.00
Detroit	†20.50-21.00
Pitts., 3 ft. and less	23.00-23.50
St. Louis, 2 ft. & less	19.75-20.25

STEEL RAILS, SCRAP

Birmingham	15.50
Boston district	†14.00-14.50
Buffalo	17.50-18.00
Chicago	16.25-16.75
Cleveland	21.00-21.50
Pittsburgh	21.50-22.00
St. Louis	16.00-16.50
Seattle	18.00-18.50

FROGS, SWITCHES

Chicago	16.00-16.50
St. Louis, cut	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	17.50-18.00

PIPE AND FLUES

Chicago, net	11.00-11.50
Cincinnati, dealers	11.00-11.50

RAILROAD GRATE BARS

Buffalo	12.00-12.50
Chicago, net	10.50-11.00
Cincinnati, dealers	9.00- 9.50
Eastern Pa.	15.50-16.00
New York	†12.00-12.50
St. Louis	11.50-12.00

RAILROAD WROUGHT

Birmingham	15.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis No. 1	11.00-11.50
St. Louis, No. 2	14.00-14.50

FORGE FLASHINGS

Boston district	†11.75-12.00
Buffalo	15.00-15.50
Cleveland	16.50-17.00
Detroit	†12.50-13.00
Pittsburgh	16.50-17.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	19.00-19.50

LOW PHOSPHORUS

Cleveland, crops	22.50-23.00
Eastern Pa., crops	24.00
Pitts., billet, bloom, slab crops	25.50-26.00

LOW PHOS. PUNCHINGS

Buffalo	20.00-20.50
Chicago	19.00-19.50
Cleveland	19.50-20.00
Eastern Pa.	23.00-24.00
Pittsburgh	23.50-24.00
Seattle	15.00
Detroit	†14.00-14.50

RAILS FOR ROLLING
5 feet and over

Birmingham	17.50
Boston	†15.75-16.00
Chicago	19.50-20.00
New York	†17.50-18.00
Eastern Pa.	23.00
St Louis	19.00-19.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Boston district	†16.00-16.50
Chicago, net	19.50-20.00
Eastern Pa.	-23.00-23.50
St. Louis	20.00-20.50

LOCOMOTIVE TIRES

Chicago (cut)	19.00-19.50
St. Louis, No. 1	16.50-17.00

SHAFTING

Boston district	†18.50-18.75
New York	†18.00-18.50
Eastern Pa.	24.00
St. Louis, 1¼-3¾".	18.50-19.00

CAR WHEELS

Birmingham, iron	19.00-20.00
Boston dist., iron	†14.50-15.00
Buffalo, steel	21.50-22.00
Chicago, iron	17.00-17.50
Chicago, rolled steel	18.00-18.50
Cincin., iron, deal.	17.00-17.50
Eastern Pa., iron	20.00-20.50
Eastern Pa., steel	23.00-23.50
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	23.00-23.50
St. Louis, iron	18.50-19.00
St. Louis, steel	18.50-19.00

NO. 1 CAST SCRAP

Birmingham	16.00
Boston, No. 1 mach.	†15.25-15.75
N. Eng. del. No. 2	17.00-17.50
N. Eng. del. textile	18.25-18.75
Buffalo, cupola	17.50-18.00
Buffalo, mach.	18.00-18.50
Chicago, agri. net	13.50-14.00
Chicago, auto net	15.00-15.50
Chicago, railroad net	14.50-15.00
Chicago, mach. net	15.00-15.50
Cincin., mach. deal.	16.50-17.00
Cleveland, mach.	20.00-21.00
Detroit, cupola, net	†14.50-15.00
Eastern Pa., cupola	20.50-21.00
E. Pa., mixed yard	17.00-17.50
Los Angeles	15.50-16.00
Pittsburgh, cupola	19.50-20.00
San Francisco	15.50-16.00
Seattle	16.00-16.50
St. Louis, breakable	14.50-15.00
St. Louis agri. mach.	17.75-18.25
St. L., No. 1 mach.	18.25-18.75
San Francisco	16.00-17.00
Toronto, No. 1, mach., net dealers	15.25-15.50

HEAVY CAST

Boston dist. break.	†13.00-13.25
New England, del.	15.50-16.00
Buffalo, break	15.00-15.50
Cleveland, break, net	15.25-15.75
Detroit, auto net	†15.50-16.00
Detroit, break	†11.00-11.50
Eastern Pa.	18.50
Los Ang., auto, net.	14.50
New York break	†14.50-15.00
Pittsburgh, break	16.00-16.50

STOVE PLATE

Birmingham	11.00
Boston district	†12.50
Buffalo	13.50-14.00
Chicago, net	9.50-10.00
Cincinnati, dealers	9.00- 9.50
Detroit, net	†9.00- 9.50
Eastern Pa.	15.50-16.00
New York, fdy.	13.00
St. Louis	11.00-11.50
Toronto dealers, net	11.00-11.50

MALLEABLE

Birmingham, R. R.	17.50
New England, del.	20.00-21.00
Buffalo	19.50-20.00
Chicago, R. R.	18.50-19.00
Cincin., agri., deal.	14.00-14.50
Cleveland, rail	22.50-23.00
Eastern Pa., R. R.	21.50-22.00
Los Angeles	12.50
Pittsburgh, rail	20.50-21.00
St. Louis, R. R.	16.50-17.00

Ores

Lake Superior Iron Ore

Gross ton, 51½ %
Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract.	9.00-10.00

Foreign Ore
(Prices nominal)

Cents per unit, c.i.f. Atlantic

Manganiferous ore, 45-55% Fe., 6-10% Mn.	14.00-15.00
North African low phos.	14.00
Spanish, No. African basic, 50 to 60%	14.00
Chinese wolframite, short ton unit, duty paid	$23.75-24.00
Scheelite, imp.	$24.00-25.00
Newfoundland fdry. 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.00-26.00

Manganese Ore

Including war risk but not duty, cents per unit cargo lots.

Caucasian, 50-52%	48.00-50.00
So. African, 50-52%	48.00-50.00
Indian, 49-50%	nom
Brazilian, 48-52%	48.00
Cuban, 50-51%, duty free	61.20

Molybdenum

Sulphide conc., per lb., Mo. cont., mines	$0.75

Sheets, Strip

Sheet & Strip Prices, Page 60, 61

Pittsburgh—Orders are declining in most sheet grades, permitting improvement in deliveries and a reduction in backlogs. A gradual decline in specifications to about 75 per cent of producing capacity is indicated. A few mills are down for repairs and some are affected by curtailed supplies from steelmaking departments which have slowed down for rehabilitation. Sheet mill schedules are close to 85 per cent, with galvanizing departments down to 75 per cent. Strip mills are somewhat below 85 per cent. Export demand generally is quiet, although some inquiries have been received.

Cleveland — Business moderated further last week, and with consumers fairly well covered the fore part of next quarter, no sharp pickup in buying is in immediate prospect. Steady shipments appear assured through January, backlogs generally requiring February delivery on new business.

Chicago—Buying has quieted considerably, but releases continue substantial. Demand is supported to a large extent by needs of automobile and farm equipment builders. Freight car building programs getting under way are expected to require larger sheet tonnages shortly.

Boston—Narrow cold strip business has declined slightly, but for first quarter delivery volume is still impressive. Re-rolling operations hold at a peak and backlogs are slightly reduced, with most mills having substantial tonnage on books for shipment through February.

New York — Specifications have moderated and likely will decline further this week, but a good volume still is appearing, and sellers generally look for active business through first quarter. Galvanized sheets are perhaps the least active, reflecting previous coverage in anticipation of higher prices that did not materialize. Deliveries are improving, but little business can be accepted for shipment before early February.

Narrow cold strip buying has declined further, but pressure for deliveries continues, with eastern producers near capacity on re-rolling. First quarter backlogs are substantial. Consumption is well maintained, but a few seasonal industrials are less active, including the typewriter assembly shops in the Hartford, Conn., district. Year-end inventories are moderate in most instances.

Philadelphia — Releases have slackened somewhat, due to seasonal influences, but producers will enter the new year with substantial backlogs. In fact, some consumers have positions on mill schedules running well into second quarter. Consumption is holding well and apparently will be affected only briefly by the holidays. At least two mills are quoting hot rolled sheets 2.35c Sparrows Point, on sizes 3/16-inch thick and less and up to 72 inches wide where small lots and prompt delivery are involved. The base on tonnage is 2.10c.

Buffalo—Sheet and strip mills are maintaining production schedules at capacity, on a five-day week basis, despite a falling off in new buying. Backlogs continue substantial.

Cincinnati—Producers will carry over considerable unfilled business into next quarter, and with orders averaging 70 to 75 per cent of capacity, heavy schedules well into February are indicated. Proportion of export business varies little from normal.

Birmingham, Ala. — Sheet and strip production continues somewhat in excess of orders, and the first of the year is expected to bring about a considerable decline in backlogs.

Toronto, Ont.—Sheet mills already have sold most of their first quarter capacity, the bulk of the tonnage being for peace-time requirements. Heavy war bookings looked for early next year are expected to develop large orders for United States producers. Advances of 15 cents per 100 pounds on blue annealed sheets and 25 cents on galvanized are expected to be announced shortly.

Plates

Plate Prices, Page 60

Pittsburgh—Plate mill backlogs still are heavy. Ship work accounts for a large part of unshipped tonnage, but heavier demand is in prospect next quarter from the railroads, based on delivery schedules for new freight cars ordered the past few months.

Cleveland—Producers will carry heavy backlogs into first quarter, despite some letdown in orders recently. Shipments continue active, but delivery of six weeks or more generally is required on new business.

Boston—Practically no business has been done at 2.35c, eastern Pennsylvania, lately and most producers have apparently abandoned efforts to better the 2.10c price for first quarter. Buying is slower, reflecting year-end inventory period, and deliveries on most sizes are improved. The 23 torpedo boats and submarine chasers booked for the navy by Electric Boat Co., Groton, Conn., will be built at Bayonne, N. J.

New York—Despite some curtailment because of the season, specifications from railroad equipment and ship builders continue active. Ship releases are expected to broaden next quarter. Tank and boiler work is in a quiet period, but a spurt is indicated with the approach of spring. Municipal tank buying has lagged this year, reflecting curtailment in government spending, and no marked improvement is seen for 1940. A relatively better outlook prevails for industrial, private utility and oil company tank needs.

Eastern plate makers, which have been quoting 2.35c base, are now generally on a 2.10c base, in line with various other producers who have been holding their prices to this level throughout the fall and who early in the month extended them for first quarter. However, eastern producers are moving cautiously, with one quoting all prices for acceptance within ten days.

Philadelphia — All district mills now are quoting 2.10c, Claymont, for January delivery. Shipments are running well ahead of new business but mills look for a comparatively high rate of activity through January. Considerable tonnage still is due railroads and shipyards, even in the case of one road which releases requirements for a car program for shipment at mill convenience.

Birmingham, Ala.—Plate business is fairly evenly divided between railroads, shipbuilding and tank manufacturers, although most tonnage for the former two has been completed. Some tonnage remains on books and there is a fairly steady flow of orders from tank producers.

Seattle—Outlook for plates during first quarter is improved as several projects will be out for bids, including a pipe line job at Cle Elum, Wash. Puget Sound Machinery Depot, Seattle, has been awarded 200 tons for a caisson for U. S. engineer, Bonneville project.

Toronto, Ont.—Inquiries for first quarter plates are appearing in increasing volume. A large tonnage will be required for the Canadian shipbuilding program, and it is expected the United States and possibly England will receive the overflow of plate orders that Canada's capacity is unable to accommodate.

San Francisco — Interest in the plate market centers around the call for bids soon on the largest inquiry of the year, 18,000 tons for a

pipe line for the water and power department, Los Angeles. Specifications have been completed and bids are expected to be called for before the end of the year. Awards for the year so far aggregate 92,206 tons, compared with 45,157 tons for the corresponding period in 1938.

Plate Contracts Placed

700 tons, 24-inch welded steel pipe, Burbank, Calif., to Consolidated Steel Corp., Los Angeles.

200 tons, caisson for Bonneville project, to Puget Sound Machinery Depot, Seattle.

Plate Contracts Pending

18,000 tons, pipe line for water and power department, Los Angeles; bids soon.

350 tons, 24-inch x ¼-inch water pipe, for Bremerton, Wash.; bids Dec. 27.

Bars

Bar Prices, Page 60

Pittsburgh—Proposal to establish delivered prices at Toledo, O., at 5 cents per 100 pounds above the arbitrary delivered prices now in effect on certain products at Detroit awaits open announcement by producers. The plan would apply on the various products for which Detroit arbitrary quotations have been applied the past few years, including bars, sheets and strip. This would make Toledo delivered prices 15 cents over Pittsburgh base figures. Toledo consumers for some time have protested against the price advantage of Detroit buyers in the face of the former's shorter rail haul from leading producing centers, and the revised pricing plan has applied in some instances lately with possibility of general adoption.

Cleveland—A further letdown in orders finds shipments unusually well sustained for this period. Continued heavy consumption is indicated after the holiday interruption, particularly in view of mill backlogs which extend into February. Earlier shipment is available on certain sizes.

Chicago—Orders have declined considerably, principally because of seasonal factors. First quarter backlogs are substantial, however, deliveries extending into February in most instances and into March in the case of one mill. Automotive needs have been prominent in alloy bar demand. Railroad car building is expected to be reflected in bar shipments soon.

Boston — Demand for alloy steel bars continues active from a widely diversified group of industrial users and government shops. Consumption is holding and little improvement in deliveries is noted. Hot carbon bar buying has slackened and deliveries have been slightly reduced. Forging material moves steadily but is somewhat slower. Bar inventories as a rule are low considering current operations.

New York—Some bar consumers continue to press for delivery, despite the season. Manufacturers of electrical equipment and machine tool builders are among the most active in issuing releases. Government specifications, particularly for navy work, are about as heavy as at any time this year. Substantial requirements throughout next quarter generally are indicated by consumers. Little tonnage is available within four to five weeks.

Philadelphia—Deliveries continue extended on new billet bars, especially smaller sizes which come close to specifications for wire rods where a shortage still exists. Movement against contracts is active, particularly to machine tool and equipment builders, chain makers, railroad car shops and ship repair plants. Rail steel bars are firm.

Birmingham, Ala.—Bar demand is holding up exceptionally well, a large part of the tonnage going to producers of agricultural implements. Sales for first quarter have tapered but a considerable volume of business remains to be completed.

Buffalo—No year-end tapering is noted in bar production, all mills working as close to capacity as steel supplies permit. Bar backlogs are the heaviest of any individual item and considerable tonnage will be on books on Jan. 1.

Pipe

Pipe Prices, Page 61

Birmingham, Ala.—Due to considerable backlogs, pipe production continues steady at four to five days a week. Current inquiries have tapered, although there has been some gain in export business. Most tonnage currently is in small lots.

Seattle—Business for the year is considered closed as contracts have been placed and no important projects are up for figures. Ellensburg, Wash., opened bids Dec. 18 for about 30 tons of 6-inch pipe and accessories.

San Francisco—With the exception of one award of cast iron pipe, 7052 tons of 12-inch pipe for the Panama Canal, schedule 3748, placed with unstated interests, awards were limited to lots of less than 100 tons. So far this year 42,753 tons have been placed, compared with 30,820 tons for the same period a year ago.

Cast Pipe Placed

7052 tons, 12-inch, Panama Canal, schedule 3748; to unstated interests.

Wire

Wire Prices, Page 61

Cleveland—Orders have slackened, as expected, but heavy backlogs point to good operations in early 1940. Unfilled orders in wire rods are especially large and will require active production through first quarter.

Chicago—Buying has eased off, following fairly heavy coverage for first quarter. Orders are expected to continue slow for several weeks, but additonal buying is looked for next quarter if consumption is maintained at a rate comparable with that recently. Automotive and farm machinery needs continue heavy. Some products, including road mesh and rural goods, are seasonally quieter.

Boston—Wire rod business continues to be allocated to regular customers and capacity at most eastern mills is sold through first quarter. Finished wire buying is off slightly, but holds to around 60-65 per cent of capacity. Consumer inventories are light. Export demand is increasing.

New York—Incoming tonnage is close to 65 per cent of capacity, new buying showing surprisingly little decline. Users' stocks are not considered excessive at the current rate of consumption which is holding for most industries. Deliveries on more common lines are improving, but little progress is being made in most specialties.

Birmingham, Ala.—Wire products hold up consistently and production is better than 90 per cent, and most items are moving direct to consumers.

Tin Plate

Tin Plate Prices, Page 60

Tin mill operations dropped 7 more points last week to 85 per cent. The decline reflects not only seasonal influences but also the fact that recent price reaffirmation has lessened pressure for delivery. Output since September has been ahead of consumption, and there are indications the peak of demand is past, although some recovery in operations from the further reduced levels over the holidays is in prospect. Export buying is quiet. British

mills generally have been able to maintain their foreign trade with more or less regular shipments.

Rails, Cars

Track Material Prices, Page 61

With little business actively pending, car builders estimate domestic freight car awards for this year at around 60,000 cars, the largest total since 1936, when 64,523 freight cars were placed. This would exceed by several thousand the 51,611 domestic freight cars placed in 1937 and by more than three times, the 16,303 awarded in 1938.

Awards for the first 11 months of this year totaled 57,740, but there has been little placed so far in December, and while there are a few fair sized inquiries still pending, including 250 to 350 gondolas for the Lehigh Valley and 500 to 1000 box cars for the New York, New Haven & Hartford, it appears likely that most of these inquiries will be carried over into next year.

New York Central will open bids Dec. 21 on pig iron, cast pipe, and other items, and Dec. 29, under the Clayton act, on a number of items involving sheets, bars, shapes, axles, plates, billets, steel piping and tubing and nails.

Chicago, Rock Island & Pacific will spend approximately $600,000 for locomotive modernization, roller bearings being applied to 55 locomotives in service and some passenger locomotives being rebuilt.

Car Orders Placed

Richmond, Fredericksburg & Potomac, six baggage-express cars, placed with unstated builder.

United Fruit Co., 77 flat cars of 25 tons capacity for Costa Rica service, to Magor Car Corp., Clifton, N. J.

Car Orders Pending

Navy, tank car for delivery to Sewall's Point, Va..; bids Jan. 2.

Buses Booked

American Car & Foundry Motors Co., New York: Twelve 36-passenger for Harrisburg Railways Co., Harrisburg, Pa.; six 39-passenger for Alexandria, Barcroft & Washington Transit Co., Alexandria, Va.; five 27-passenger for Rochester Transit Corp., Rochester N. Y.; five 36-passenger for Des Moines Railway Co., Des Moines, Iowa; four 36-passenger for Gary Railways Co., Gary, Ind.; four 34-passenger for Valley Transportation Co., Lemoyne, Pa.; two 39-passenger for Eastern Massachusetts Street Railway Co., Boston; two 39-passenger for Williamsport Transportation Co., Williamsport, Pa.; two 36-passenger for San Diego Electric Railway Co., San Diego, Calif.

Twin Coach Co., Kent, O.: Ten 41-passenger for Milwaukee Electric Railway & Transport Co., Milwaukee; ten 27-passenger for Cleveland Railway Co., Cleveland; ten 27-passenger for Denver Tramway Co., Denver; ten 29-passenger for Westchester Street Transportation Co., Bronx, N. Y.; six 42-passenger for Youngstown Municipal Railway, Youngstown, O.; six 23-passenger for Winnipeg Electric Co., Winnipeg, Man.; four 29-passenger for Valley Motor Transit Co., East Liverpool, O.; four 35-passenger for Columbus & Southern Ohio Electric Co., Columbus, O.; three 31-passenger for Lincoln Traction Co., Lincoln, Nebr.; two 31-passenger for Co-operative Transit Co., Wheeling, W. Va.

Shapes

Structural Shape Prices, Page 60

Pittsburgh—Fabricated shape orders are light, but are well balanced between industrial needs and public works. Inquiries are largely for private jobs. Shape mills are cutting into backlogs.

Chicago—Specifications for plain material are holding up fairly well, but orders have tapered further. Seasonal factors account partly for the present letdown, although for some time structural business has been less satisfactory than that in other steel products.

Boston—Contracts are heavier, including two double naval airplane hangars, Squantum, Mass., and Quonset Point, R. I., approximately 2000 tons going to Bethlehem Steel Co., Bethlehem, Pa. Power plant extensions, Providence, R. I., account for 335 tons, while bridge awards are estimated at 350 tons. Bids on the 400-ton bridge, Huntington, Mass., have been postponed to Jan. 3.

New York—Bids are expected early in the year on a 13,000-ton superstructure for an approach section, midtown tunnel, Queens, the largest prospective inquiry. Awards include 9000 tons for ten hangars for the navy department, one of which is for Floyd Bennett field, Long Island, N. Y., and a 700-ton school, New York.

Philadelphia—Shape backlogs are lighter than for most other products and not much improvement is seen before spring. One independent, however, continues busy on orders booked some time ago but is reported to have dropped its price to 2.10c, Bethlehem, Pa. Some export business in fabricated material is reported with South America, reflecting lack of German competition.

Seattle—Current business is small but important projects will be up early in the new year. Fabricators report some difficulty in obtaining satisfactory deliveries. Pacific Car & Foundry Co., Seattle, has been awarded 100 tons for radio towers at Sitka, Alaska, navy air defense project. Bids are in to navy department, Puget Sound yard, for quay walls calling for 270 tons of sheet piling. A new design for launching ways for the Port Orford, Oreg. coast guard station, bids in, requires 20 tons.

San Francisco—The structural steel market was the most active one of the week and 19,347 tons were booked, bringing the aggregate to date to 177,876 tons, compared with 161,985 tons for the same period last year. Unstated interests took 3425 tons for tunnel supports for the Continental Divide tunnel, Colorado-Big Thompson project, Colorado. Bethlehem Steel Co. secured 1983 tons for an engineering shop for the navy department at Hickam Field, T. H., and 1280 tons for a navy assembly shop at Pearl Harbor.

Shape Awards Compared

	Tons
Week ended Dec. 23	**23,268**
Week ended Dec. 16	**25,806**
Week ended Dec. 9	**9,721**
This week, 1938	**35,067**
Weekly average, year, 1938	**21,568**
Weekly average, 1939	**22,561**
Weekly average, November	**23,003**
Total to date, 1938	**1,088,521**
Total to date, 1939	**1,150,609**

Includes awards of 100 tons or more.

Shape Contracts Placed

9000 tons, structural steel work for 10 hangars, various stations, bureau of yards and docks, navy department as follows: two double hangars, naval air station, Jacksonville, Fla., one single hangar at naval air station, Banana River, Fla. and one double hangar at naval station, Key West, Fla. to Steel Construction Co., Birmingham, Alabama, $329,300; one double hangar each at naval air station, Quonset Point, R. I. and naval reserve aviation bases, Squantum, Mass. and Floyd Bennett field, Long Island, N. Y. to Bethlehem Steel Company, Bethlehem, Pa., $304,700; two double hangars at the naval air station, San Juan, P. R., to Robert R. Prann, P. O Box 144, San Juan, P. R., $232,300; one single hangar at the naval station, Guantanamo, Cuba, to Midland Structural Steel Company, Cicero, Ill., $61,052.

3425 tons, tunnel supports, Continental Divide tunnel, Colorado-Big Thompson project, Colo., to unstated interest.

2600 tons, power plant, lock gates, cranes, machinery and steel work, Charleston, S. C., to Virginia Bridge Co., Roanoke, Va.

1983 tons, engineering shop, Hickam Field, T. H., to Bethlehem Steel Co., Bethlehem, Pa.

1275 tons, assembly shop for navy department, Pearl Harbor, T. H., to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, public school 114, New York, to Bethlehem Steel Co., Bethlehem,

Pa.; John E. Brady Co., New York, contractor.

480 tons, state highway bridge RC-4090, Poughkeepsie, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

452 tons, viaduct over Devils Lake Fork of Wilson river, Tillamook County, Oreg., for state, to Poole & McGonigle, Portland, Oreg.

410 tons, substructure, filtration plant, Chicago, to A. J. O'Leary Co., Chicago.

400 tons, addition to Highland Park plant, for Ford Motor Co., Detroit, to Whitehead & Kales Co., Detroit.

360 tons, addition, laboratory, department of agriculture, Wynnewood, Pa., to Bethlehem Steel Co., Bethlehem, Pa., through M. & L. Construction Co., Philadelphia.

255 tons, store building, F. W. Woolworth Co., Saginaw, Mich., to American Fabricating Steel Co., Saginaw.

213 tons, bulkhead gates, Tennessee Valley authority, Knoxville, Tenn., to Carolina Steel & Iron Co., Inc., Greensboro, N. C., bids Dec. 5; also structural steel for Watts Bar dam to Lakeside Bridge & Steel Co., Milwaukee, bids Dec. 6.

200 tons, state bridge, Plaistow, N. H., to American Bridge Co., Pittsburgh.

165 tons, soda ash and bromine plants, American Potash & Chemical Co., Trona, Calif., to Atlas Scraper & Engineering Co., Bell, Calif.

160 tons, Allegheny Mountain tunnel, Somerset, Pa., for Pennsylvania turnpike commission, to American Bridge Co., Pittsburgh.

145 tons, turbine supports, New England Power Service Co., Providence, R. I., to American Bridge Co., Pittsburgh.

140 tons, Coca Cola building, Oakland, Calif., to Moore Drydock Co., Oakland, Calif.

130 tons, beam spans, Rockport, Ky., for state, to Vincennes Steel Corp., Vincennes, Ind.

125 tons, substation addition, Narragansett Electric Co., Providence, R. I., to James H. Tower Iron Works, Providence.

125 tons, railroad subway, Walworth, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

115 tons, extension to plate shop, for Pusey & Jones, Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.

110 tons, temporary buildings, navy yard, San Diego, Calif., to Pacific Iron & Steel Co., Los Angeles.

100 tons, bridge FAP-22C (1), Dallas county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

100 tons, bridge FAP-83B (4), Clarke county, Mississippi, to Jones & Laughlin Steel Corp., Pittsburgh.

100 tons, radio towers for navy air defense station, Sitka, Alaska, to Pacific Car & Foundry Co., Seattle.

Shape Contracts Pending

5300 tons, appraisers' store and immigration station, San Francisco; Clinton Construction Co., 923 Folsom street, San Francisco, low on general contract at $3,661,000.

2000 tons, superstructure, municipal light plant, Cleveland; general contract awarded to Schirmer Peterson Co., Cleveland.

1500 tons, state hospital building, Kings Park, N. Y., Lehigh Structural Steel Co., Allentown, Pa., low, bids Dec. 20, on steel direct.

1000 tons, building, for Tishman Realty & Construction Co., New York.

975 tons, pontoon hull and superstructure for gold dredge for Yuba Mfg. Co., San Francisco; pending.

780 tons, buildings for naval air base, Alameda, Calif.; bids opened.

606 tons, seaplane hangar, for navy, Sitka, Alaska.

562 tons, industrial laboratory and auditorium, department of agriculture, Albany, Calif.; James I. Barnes Construction Co., 206 Builders Exchange building, Santa Monica, Calif., low on general contract at $450,200.

500 tons, additions to grandstand, for Empire City Racing association, Yonkers, N. Y.

370 tons, state bridge RC-4080, Irving, N. Y.

350 tons, shop addition, Chapman Valve Co., Indian Orchard, Mass.

350 tons, manufacturing plant, first unit, for Cincinnati Milling Machine Co., Cincinnati.

350 tons, extension to mill building, for Chapman Valve Co., Indian Orchard, Mass.

300 tons, garage, Green Bus Co., Brooklyn, N. Y.

300 tons, store building, for S. S. Kresge Co., Bay City, Mich.

275 tons, footings, Midtown highway, Queens, New York.

270 tons, steel sheet piling, quay construction, Puget Sound navy yard; bids in.

200 tons, office building, for Ohio Bell Telephone Co., Steubenville, O.

200 tons, beam spans, Ingham-Eaton counties, Michigan, for state.

173 tons, over-crossing at Weed, Siskiyou county, California, for state; bids Jan. 3.

150 tons, case structure at reforming cases, for Sun Oil Co., Marcus Hook, Pa.

150 tons, additions to plant buildings, for Krompton-Shenandoah Co., Waynesboro, Va.

120 tons, state bridges SS-39.25, Voorheesville, N. Y.

100 tons, bridge reconstructioin, Twenty-third street and outer drive, Chicago; bids to Chicago park district, Jan. 9.

Unstated, gates, hoists and equipment for Leavenworth, Wash., fish control project; bids to Denver, Jan. 3.

Steel in Europe

Foreign Steel Prices, Page 63

London—(*By Cable*)—Raw materials supplies in Great Britain's steel industry are satisfactory except that steelmaking scrap is scarce. Semifinished output will be supplemented by 250,000 tons from Belgium, to be delivered over two months. All steelmaking departments are fully occupied and some tonnages are being released for export.

Belgium and Luxemburg report they are unable to meet export demand, with works operating as full as possible with available raw materials.

Reinforcing

Reinforcing Bar Prices, Page 61

Pittsburgh—Pending business is unchanged, but mill backlogs are receding. Both inquiries and awards are light, held down partly by seasonal factors. Several fairly large orders have been placed in the South and Southwest.

Chicago—Demand is quiet, and although a fairly large tonnage is pending, seasonal influences have been a restraining factor. Pending business includes 1500 tons for the local subway and 7500 tons for a Chicago filtration plant. Inquiries are expected to be slow to increase until spring.

Boston—A flurry in buying is accounted for by housing projects, approximately 2600 tons having been placed, with several substantial projects still pending. Demand elsewhere is light. While prices are firmer than usual, occasional shading crops out.

New York—Bethlehem Steel Co. appears low on 4750 tons of bars for a flying field base, Porto Rico. This is the largest pending tonnage in this area, followed by 1500 tons for a housing project, New Haven, Conn., bids on which have been postponed to Jan. 4. Current buying is light.

Philadelphia — Government financed work continues to dominate the market, with several housing jobs and highway work outstanding. Prices on formed bars are holding to recent levels.

Seattle—The market is seasonally quiet although prospects are promising for first quarter with several important postoffices and other structures, concrete construction specified, up for early action. Business pending is at the year's lowest levels.

San Francisco — Bids have just been opened on a number of new projects calling for over 10,900 tons of reinforcing bars, while pending business exceeds 17,000 tons. Awards aggregated 2458 tons, bringing the total to date to 163,105 tons as compared with 153,727 tons for the corresponding period in 1938.

Reinforcing Steel Awards

2000 tons, Phelps-Dodge Corp., Morenci, Ariz.; 1000 tons to Columbia Steel Co., San Francisco, 1000 tons to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, housing project, Lowell, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; M. S. Kelliher Co., Boston, contractor.

575 tons, bureau of reclamation, invitation 44,412-A, Earp, Calif., to Columbia Steel Co., San Francisco.

515 tons, bridge, Jasper, Mo., to Sheffield Steel Corp., Kansas City.

500 tons, bridge, FAGM-56-B, Jasper,

Mo., to Sheffield Steel Corp., Kansas City, Mo.

400 tons, canal locks, Dismal swamp, Deep Creek, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Virginia Steel Co.; Maxon Construction Co., contractor.

314 tons, bridge, Latimer county, Okla., to Sheffield Steel Corp., Kansas City.

300 tons, mesh, highway project RC-4079, Hope Center-Wells, Hamilton county, New York to Truscon Steel Co., Youngstown, O.; Collins Bros., Mechanicville, N. Y., general contractors, $418,284.25.

300 tons, bridge, Latimer county, Oklahoma, to Sheffield Steel Corp., Kansas City, Mo.

250 tons, mesh, highway project RC-4071, Dansville-Geneseo, Livingston county, New York, to American Steel & Wire Co., New York; Rochester Concrete Construction Co., Inc., Rochester, N. Y., contractor, $272,449.45.

235 tons, bureau of reclamation, invitation A-46,808-A, Rutledge, Texas, to Sheffield Steel Corp., Kansas City, Mo.

235 tons, bureau of reclamation, invitation A-46,811-A, Rutledge, Texas, to Sheffield Steel Corp., Kansas City, Mo.

170 tons, mesh, highway project RC-4087. Fulton-Phoenix, Oswego-Onondaga counties, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Warren Bros. Roads Co., Cambridge, Mass., general contractors, $277,527.15.

102 tons, Noble county construction, Ponca City, Okla., to Sheffield Steel Corp., Kansas City.

Reinforcing Steel Pending

4750 tons, army flying base, Porto Rico, bids Dec. 21, quartermaster depot, Brooklyn, N. Y. Bethlehem Steel Co., Bethlehem, Pa., low alternate deliveries, Brooklyn, Porto Rico and Charleston, S. C., navy yard.

3000 tons, appraisers' store and immigration station, San Francisco; Clinton Construction Co., 923 Folsom street, San Francisco, low on general contract at $3,661,000.

2800 tons, Terrace Village housing, Pittsburgh.

1500 tons, housing project, New Haven, Conn., bids postponed to Jan. 4.

1400 tons, Sunnydale housing project, San Francisco; bids opened.

728 tons, naval ammunition buildings, Hawthorne, Nev.; bids opened.

530 tons, subway station section S-9A, Chicago; rebidding Jan. 4.

450 tons, Shandire apartments, Milwaukee.

450 tons, Massachusetts avenue bridge over Rock Creek, Washington.

400 tons, subway station section S-9C, Chicago; Kenny Construction Co., Chicago, low bidder on general contract.

305 tons, Campbell village housing project, Oakland, Calif., K. E. Parker, 135 South Park St., San Francisco, low on general contract at $462,475.

300 tons, housing project, Chicopee, Mass.

250 tons, filtration plant, Pleasantville, N. J.

170 tons, highway bridge, Huntington, Mass.; bids postponed to Jan. 3.

148 tons, bureau of reclamation, invitation A-46,828-A, Rutledge, Texas; bids opened.

130 tons, quay walls, Puget Sound navy yard; bids in.

100 tons or more, two building additions to North Vancouver, Wash., power substation; bids in to Bonneville authority, Portland, Oreg.

Unstated, rearing ponds, Coulee dam project, Leavenworth, Wash.; David Nygren, Seattle, low.

Concrete Bars Compared

	Tons
Week ended Dec. 23	**6,896**
Week ended Dec. 16	**3,348**
Week ended Dec. 9	**3,376**
This week, 1938	**11,814**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**9,283**
Weekly average, November	**5,806**
Total to date, 1938	**356,752**
Total to date, 1939	**473,447**

Includes awards of 100 tons or more.

Pig Iron

Pig Iron Prices, Page 62

Cleveland—The seasonal tapering in deliveries is moderate, reflecting well sustained foundry schedules. A further letdown is in prospect this week, but December pig iron ship-

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COLD SPRAY-GRANODIZING, using the solution at room temperature, saves money by saving steam, in addition to other advantages of the GRANODINE process. It makes GRANODIZING possible in many cases in which a limited steam supply has made it impracticable.

This development in GRANODIZING is especially interesting to manufacturers of automobile bodies and fenders, refrigerator cabinets, washing machines, and many other sheet-steel products which are protected by phosphate coating under the applied finish.

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ments are expected to compare favorably with November's.

Chicago—Shipments at the end of last week were still ahead of the same period in November, 7 to 8 per cent in some cases. Releases are dropping because of the holidays, and the month as a whole will probably end slightly below November.

Boston—Consumers are covering first quarter requirements more actively, buying the last week being heaviest this quarter. Shipments this month compare well with November and most consumers will take practically all the iron due them on contracts.

New York—Some foundries will close for inventory-taking the next 10 days, but suspensions will be less general than in most recent years. Pig iron sellers look for heavier specifications early in January, with an appreciable increase in buying in late February. Producers will be unable to work off by Dec. 31 all the tonnage booked prior to the fall price advance.

Philadelphia—Releases reflect the holiday period but some furnaces still are behind on shipments. Comparatively little new business is reported. Tonnage booked for fourth quarter will carry well into first period. Prices are firm.

Cincinnati—Shipments show less than the usual year-end slackening, and December deliveries will be close to those of November. Producers have rewritten considerable tonnage which will carry most melters well into first quarter.

St. Louis—Shipments are receding, following an unusually heavy movement during the fall. Some users have requested a delay in deliveries until January, this being influenced by price reaffirmation, stock accumulations and a seasonal recession in foundry operations.

Toronto, Ont.—Few melters are placing first quarter contracts, although some spot sales of 50 to 200 tons are being made. Melters covered by contract continue to accept delivery and are building up stocks against future needs. Heavy first quarter demand is expected if anticipated large war material contracts are placed soon.

Warehouse

Warehouse Prices, Page 63

Chicago—Business is easing off seasonally, but the decline so far has been less than in previous years and December sales are expected to be close to those of November.

Philadelphia—December business will show only a small decline, it is indicated. A holiday drop of only 15 per cent is reported compared with a usual 40 per cent. Inventories are in better shape but stocks of some items still are not well rounded out.

Buffalo—Business has moderated but still is considered favorable, and recovery is expected in January.

Cincinnati—Demand has been sustained throughout the month, assuring a good December total despite an anticipated letdown this week. Industrial needs are steadier than usual.

St. Louis—The usual seasonal letdown in sales has been absent lately. Mild weather has retarded demand for certain items but has helped business in some products for rural areas.

Scrap

Scrap Prices, Page 64

Pittsburgh—Demand is dull and prices largely are nominal. Frequent sales are being made to small buyers, but in most cases tonnage is insufficient to cause further revisions in quotations. Opinion is divided on the January outlook, but most scrap sellers do not look for renewed buying until late in the month.

Chicago—Prices again have weakened under the influence of quiet mill demand. No. 1 steel is off 50 cents on a sale to a local steelworks at $16.50, and most other grades also are lower, some being off as much as $2. Business is expected to remain slow until after the holidays.

Boston—Buying has slumped, although the Worcester, Mass., consumer has taken some additional heavy melting steel, paying $16.50 and $15, respectively, for the two grades.

New York—Despite the fact scrap activity is limited to light shipments to eastern mills and there is little new buying, prices are steadier. Exceptions are 50-cent reductions in No. 1 machinery cast and rerolling rails. Lack of shipping still retards buying for export to Europe, although some scrap is moving to Japan.

Philadelphia—Scrap releases have declined due to slower operations and year-end inventory taking. At least one mill has cut off all shipments for a short period. Further downward adjustments are noted in several grades, including cast and No. 2 steel. Last sale of No. 2 was at $17.50, but a $17 market is indicated.

Buffalo—With two leading consumers holding up shipments and another reducing its bid an additional $1, prices on steelmaking scrap grades have been pared 50 cents or more. This brings No. 1 steel down to $17 to $17.50. Most grades are nominal.

Detroit—Recent price declines in most cases appear to have run their course, but the trade looks for no upturn before mid-January, if then. Fairly large tonnages of bundles have been sold lately at $13.75 to $14.25. No. 1 busheling, heavy breakable cast, low-phos plates and short turnings are off 50 cents.

Cincinnati—Market activity has declined, with consumer buying apparently deferred until after the holidays. Meanwhile dealers look for a stronger market and are increasing stocks moderately. Prices are fairly steady on latest buying.

St. Louis—The market continues quiet in the absence of consumer buying, and prices on most grades remain weak. Quotations on a number of leading items are below levels prevailing before September.

Toronto, Ont. — Prices are unchanged, but sentiment in steel grades is weaker. However, mills continue to close contracts without change in bid prices. Demand for steel scrap is active, with shipments sustained. Cast grades are in demand for both spot and future delivery. Scrap offerings generally continue heavy.

Seattle—Pending abrogation of the trade treaty with Japan has slightly stimulated placing of orders but volume is restricted by exchange and the permit system. Dealers are unwilling to make open quotations in view of the existing uncertainty and individual sales are based on conditions in each case.

Birmingham, Ala.—Scrap demand has tapered considerably the past week and momentarily is particularly slow. Prices, while nominal, tend downward.

Iron Ore

Iron Ore Prices, Page 64

New York—Prices submitted the government on manganese ore last week indicate 50 to 52 per cent material of high standard is obtainable in sizable quantities at 48 to 50 cents per unit, before duty, in cargo lots. This is slightly below the range quoted recently. However, the market still is strong, due largely to conditions abroad.

Tungsten ore is slightly easier. Chinese wolframite is holding at $23.75 to $24 per short ton unit, duty paid; imported scheelite at $24 to $25 and domestic scheelite at $23.75 to $24.

Cleveland — November consumption of Lake Superior iron ore reached a new high for the year at

5,477,969 tons, compared with 5,270,707 tons in October and 3,150,073 tons a year ago, according to the Lake Superior Iron Ore association. Consumption for the year to Dec. 1 totaled 38,822,915 tons, against 22,662,350 tons a year ago.

Ore stocks at furnaces and Lake Erie docks increased moderately during November but on Dec. 1 were only 8.7 per cent larger than a year ago. Comparisons follow:

Gross Tons on Hand

	At furnaces	On docks	Total
Dec. 1, 1939	35,515,600	5,216,496	40,732,096
Month ago	33,943,773	5,120,884	39,004,657
Year ago	32,166,031	5,290,294	37,456,325

Equipment

Chicago — Machinery sales have slowed up seasonally until after Jan. 1, sellers indicate. The market remains encouraging, with considerable work still pending, and an improvement in railroad buying looked for in the first quarter. Milwaukee railroad, which had one of the largest lists, has held purchase over until 1940. Santa Fe is expected to come in for sizable purchases. An increase in machinery needs of structural interests is reported. Sheet metal shops have been prominent buyers recently.

Seattle — Electrical items and pumping projects, mostly public works, are furnishing most of the present volume, other items being seasonally in less demand. Denver has called bids Jan. 2 for furnishing eleven 57-inch motor-operated butterfly valves for the Coulee dam spillway, Spec. 1312-D. Sunnyside, Wash., has called bids for pumping equipment.

Heavy Ore Imports in Baltimore District

Baltimore—Iron ore importations here in November of 219,318 tons bring total arrivals for the first 11 months to 2,094,540, compared with 1,792,547 in the corresponding period of last year.

Arrivals last month of 37,333 bring total manganese ore importations for 11 months to 357,581 tons, against 403,432 in the first 11 months of last year, and importations of 11,681 tons in November bring total shipments of chrome ore for the first 11 months up to 79,282 tons, against 107,171 tons in the same period in 1938.

Ferroalloys

Ferroalloy Prices, Page 62

New York—Ferromanganese shipments this month will extend the decline noted in November and October. This reflects not only the previous heavy movement but also a slight easing in steel production. Prices generally are unchanged, but, as noted recently, base quotations on chrome alloys will be advanced Jan. 1.

Large Orders For Tin Placed By Government

Award of five contracts for a total of 6,560,000 pounds of pig tin, under provisions of the strategic materials act, was announced last week by the federal procurement division. Delivery has been guaranteed within six months.

Contracts were placed as follows: American Metal Co., 200,000 pounds of Bolivian tin at 47.22c per pound; Caswell, Strauss & Co., 2,240,000 pounds of Dutch East Indies tin at 47.16c; Domestic & Foreign Commerce Corp., 1,000,000 pounds of Dutch East Indies and Straits tin at 48.25c; Metal Traders Inc., 1,120,000 pounds of Straits tin at 48.2c; and C. S. Trench & Co., 2,000,000 pounds of Straits tin at 47.44c.

FROM ORE TO METAL

The Story of St. Joe Electro-Thermic Zinc No. 10 of a Series

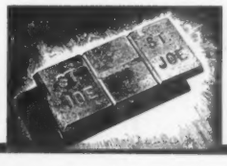
"Tapping the Condenser"

METHOD OF CONDENSING ST. JOE ELECTRO-THERMIC ZINC

The Josephtown continuous condenser is a unique metallurgical development permitting the condensation of large volumes of zinc vapor into metal. Incoming gases from the electro-thermic furnace are bubbled through a bath of molten zinc. The effect is similar to that of a jet condenser

The condenser is in the shape of a huge U-tube with one arm, the outgoing branch, slanting upward at an angle of 30° from the horizontal. Vacuum applied to the outgoing branch displaces the bath so that a bubble of gas is drawn down the incoming branch and around the bend. The bubble then rushes up the outgoing branch, where it slightly releases the vacuum, allowing the metal to fall back. This constant sloshing back and forth of the metal bath efficiently scrubs the gas and condenses the metal vapor.

The overall length of the condenser is about 14 feet. The metal bath carries 12 tons, and about 15 tons of zinc is produced by each condenser during 24 hours of operation. Periodically, 1500 pounds of high purity molten zinc is tapped from the condenser, carefully sampled, and cast into slabs of St. Joe electro-thermic zinc.



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Behind the Scenes with STEEL

■ This week Shrdlu, having sneaked out to do his last minute Xmas shopping, turns things over to the artistic hands of Pat Dwyer, Jr., son of *The Foundry's* widely known Pat ("The Adventures of Bill") Dwyer, and a member of STEEL's bang-up copy and art service department. Young Pat takes to this sort of thing as easily as John Kieran quotes from Mr. Shakespeare. Apparently it's the Irish in 'em.

THE LAME SMITH GOD

There's a legend on Olympus
That a smith god, gay and lame,
Fashioned armor for Achilles
With his thunder stroke and flame.
Only craftsman on Olympus,
Lame Hephaistos was more:
With his cunning skill and wisdom
He refined and smelted ore.

Then he took the glowing metal
And he hammered it and laughed,
For Hephaistos was happy
When he labored at his craft.
Men and gods came trooping after
This Hephaistos, to gorge
Their desire for the weapons
That he fashioned on his forge.

Thus the laughing god, the craftsman,
Although crippled by a fall
From Olympus down to Lemnos,
Wrought in metal for them all:
Mighty Zeus, himself, commanded
That the lame smith god should wield
His big hammer on the anvil
And create for Zeus a shield.

Agamemnon and Demeter
Waited, patient, on his skill;
Neither thunder of his hammer
Nor his forge were ever still.
He made arrows for Apollo,
And his furnace, flaming, roared
When for Perseus he fashioned
An enchanted, gleaming sword.

Master craftsman of Olympus,
He is patron of the band
That yet fabricates with metal,
And creates with cunning hand
The metallic wonders extant.
Lame Hephaistos, we feel,
Is the ancient inspiration
For our solid dreams in steel.

—Pat Dwyer, Jr.

Labor Board Inquiry

(*Concluded from page* 14)

lieved probable. Representative Ramspeck, Georgia, and ranking member of the regular house labor committee (not the special committee investigating the board) has declared for a thorough housecleaning in the board. He would oust Chairman J. Warren Madden, and Edwin S. Smith and build a new board around Dr. Leiserson.

Representative Ramspeck also would amend the Wagner act to give employers the same right to ask for a bargaining election as the workers now have.

National Association of Manufacturers released a well-timed report by its committee on employment relations, composed of 100 leading industrialists, in which 12 amendments were suggested. These included: "Reasonable limitation on the right to strike; outlawing of the closed shop and checkoff; a provision permitting employers to petition for elections among employes; a requirement that labor organizations file certificates of their responsibility with the board.

Changes Suggested

The manufacturers committee said administration of the law and the act itself have:

"Destroyed confidence in its fairness.

"Destroyed confidence in its administration.

"Protected sitdown strikers and other strikers engaged in violence, intimidation and coercion.

"Been one-sided; assumes that only employers can be guilty of unfair labor practices.

"Fails to protect employes against any and all coercion.

"Compelled employers to continue to bargain with representatives of a union which had violated agreements already made with the employer.

"Tried to prevent employers from expressing their opinions, even from truthfully stating the facts about unionism in general or particular unions.

"Denied the right to ordinary provisions of a fair trial, including full statement of charges, equal rights to subpoena witnesses, and equal rights to introduce evidence.

"Sought to destroy independent unions not affiliated with either the CIO or AFL, notwithstanding the fact that such organizations were lawfully initiated many years ago.

"Exhibited hostility toward the employers and their associations while championing the right of employes to organize into associations.

"Increased the number of labor disputes and threats of labor disputes."

Nonferrous Metal Prices

Dec.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
16	12.50	12.50	12.37½	50.75	47.75	5.50	5.35	6.00	20.00	14.00	35.00
18	12.50	12.50	12.37½	50.50	48.00	5.50	5.35	6.00	20.00	14.00	35.00
19	12.50	12.50	12.37½	50.25	48.00	5.50	5.35	6.00	20.00	14.00	35.00
20	12.50	12.50	12.25	50.25	48.00	5.50	5.35	6.00	20.00	14.00	35.00
21	12.50	12.50	12.25	49.75	47.12½	5.50	5.35	6.00	20.00	14.00	35.00
22	12.50	12.50	12.25	50.25	48.00	5.50	5.35	6.00	20.00	14.00	35.00

*Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.50c Conn. copper

Sheets

Yellow brass (high)	19.31
Copper, hot rolled	21.12
Lead, cut to jobbers	8.75
Zinc, 100 lb. base	11.25

Tubes

High yellow brass	22.06
Seamless copper	21.62

Rods

High yellow brass	15.23
Copper, hot rolled	17.62

Anodes

Copper, untrimmed	18.37

Wire

Yellow brass (high)	19.56

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	8.37½-8.50
Cleveland	8.75- 9.00
Chicago	8.75-9.00
St. Louis	8.25-8.50

Heavy Copper and Wire

New York, No. 1	10.00-10.25
Cleveland, No. 1	10.00-10.25
Chicago, No. 1	10.00-10.25
St. Louis	9.25-9.75

Composition Brass Turnings

New York	8.00-8.25

Light Copper

New York	8.00-8.25
Cleveland	8.00-8.25
Chicago	7.87½-8.12½
St. Louis	7.25-7.50

Light Brass

Cleveland	4.75-5.00
Chicago	5.62½-5.87½
St. Louis	5.00-5.50

Lead

New York	4.85
Cleveland	4.37½-4.50
Chicago	4.25-4.50
St. Louis	4.00-4.25

Zinc

New York	3.50-3.75
Cleveland	3.25-3.50
St. Louis	3.25-3.50

Aluminum

Mixed, cast, Cleveland	10.25-10.50
Borings, Cleveland	7.75-8.00
Clips, soft, Cleveland	15.75-16.00
Misc. cast, St. Louis	8.75-9.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.00
Standard No. 12 aluminum	15.00-15.50

Nonferrous Metals

New York—Domestic metal markets firmed last week, following the upward revision in maximum prices on lead, zinc and copper in Great Britain. Turnover in lead was moderate but all others were quiet.

Copper—Producers continued to quote 12.50c, Connecticut, on electrolytic but lowered casting copper ⅛-cent to 12.25c, f.o.b. refinery. Resale electro for spot delivery held close to 12.75c while export copper was quieter and easier at 12.60c, f.a.s. New York.

Lead — A few sellers balanced their intakes on several days, the first time in several weeks. Prices held firm at 5.35c, East St. Louis, reflecting in part the further drop of 15,902 tons in refined stocks to a total of only 58,061 tons, a new low since June, 1930.

Zinc—Although galvanized sheet output has shown a smaller decline than is usual at this season, dipping to 75 per cent or only four points under the high for recent years, sales continued very light. Only one seller quoted on the 6-cent basis and this factor reported light sales.

Tin—Treasury department awarded contracts for 6,560,000 pounds of tin, apportioned between five sellers. This constituted the only important business booked during the week. Only minor fluctuations were recorded with spot ranging from 49.75c to 50.50c.

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BECAUSE: Hi-Tensile "F" is a fast-running rod. It is quiet and smooth—and has good penetration. Welders find it equally useful on horizontal, vertical and overhead jobs. It is very handy for work in close quarters. Slag and spatter losses are very low.

A weld made with HI-TENSILE "F" has great strength and high ductility—withstands shock exceptionally well.

HI-TENSILE "F" is an ideal electrode for jobs in Cro-Man-Sil, Cor-Ten, H.T.-50 and many other new alloy steels.

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Construction and Enterprise

Ohio

AMHERST, O.—Plans are maturing for municipal power plant, costing about $145,000. Contracts for equipment will be placed soon. Floyd G. Browne, Marion, O., consulting engineer.

DAYTON, O.—United States war department, construction division, Don L. Hutchins, major, air corps, constructing quartermaster, Wright field, will take bids Jan. 3, 11 a. m., invitation Er QM 6681-40-29, (A) one duplex centrifugal vacuum return pump, one motor drive, one steam turbine driven, each to have capacity of not less than 150,000 square feet steam radiation and discharge against pressure of not less than 30 pounds. (B) One centrifugal vacuum return pump, steam turbine operated.

HARRISON, O.—New sanitary sewerage system, pumping station and disposal plant are planned. Estimated cost $185,000. Hermann & Loomis, 618 Oak street, Newport, Ky., engineers.

LAKEWOOD, O.—City, A. I. Kauffman, mayor is considering erection of water supply system and plant. J. N. Chester Engineers, Century building, Pittsburgh, consulting engineer, is making surveys on sites under consideration as location. Original plans call for plant with capacity of 14,000,000 gallons per day, with 7000-foot intake, filtration plant, and water tunnel to supply Lakewood, Rocky River and Bay village. Cost about $1,750,000.

MEDINA, O.—Board of trustees of public affairs, S. F. High, acting mayor; W. Faye Fenton, clerk, will take bids at noon, Dec. 28, to furnish and install one diesel engine and high service centrifugal water pump, one low service water pump and motor to operate same, cost not to exceed $18,000; also make necessary repairs and alter storage tanks, cost not to exceed $3500.

NEW BREMEN, O.—Waterworks improvements, elevated storage tank and water softening plant are being considered. Estimated cost $20,000. Champe, Finkbeiner & Associates, Nicholas building, Toledo, O., architects. Bids after Jan. 1.

SABINA, O.—City will spend about $42,000 for improvements in municipal power plant, including installation of new equipment.

THOMPSON, O.—Thompson Silica Co., recently incorporated, care of Primus C. Clark, president, Clark Controller Co., 1146 East 152nd street, Cleveland, plans erection of silica plant, including installation of electrically-operated steam shovels, crushers, washing machines, building for maintenance and garage purposes.

TROY, O.—Hobart Mfg. Co., W. Hartley, factory manager, plans to erect power plant addition, and will install 50-horsepower steam boiler. Cost $75,000. W. E. Barrows, 1164 Reibold building, Dayton, O., engineer.

Connecticut

HARTFORD, CONN.—Hanson-Whitney Machine Co., 139 Bartholomew avenue, plans to build a four-story addition to machine works, 60 x 80 feet; also will build addition to boiler house, with installation of new boiler unit and auxiliary equipment. Cost estimated over $80,000. John T. Henderson, 750 Main street, architect and engineer.

Massachusetts

EAST BOSTON, MASS.—Syndicate, care of P. Bertelson, 31 Milk street, Boston, is remodeling the old Mead Morrison works here into an airplane manufacturing factory.

EVERETT, MASS.—Monsanto Chemical Co. plans erection of two-story addition to plant, costing about $60,000 with machinery and power equipment.

New York

FAIRHAVEN, N. Y.—Bids will be taken soon after Jan. 1 for erection of waterworks system, estimated to cost $80,000. William S. Lozier Inc., 10 Gibbs street, Rochester, N. Y., engineer.

New Jersey

IRVINGTON, N. J.—Lionel Corp., 28 Saeger place, has filed plans for one-story addition to electrical and mechanical toy manufacturing plant, 200 x 400 feet, costing about $100,000 with machinery and power equipment. Daniel J. Scrocco, 210 Tremont street, Orange, N. J., architect.

Pennsylvania

HARRISBURG, PA. — Pennsylvania Power & Light Co., Allentown, Pa., plans improvements in steam-electric power plant here, with installation of new 10,000-kilowatt turbine generator and accessories, two high pressure boilers and auxiliary equipment. Cost close to $3,000,000. Bids to be taken soon.

LANCASTER, PA.—Armstrong Cork Co. has approved plans for improvements in boiler house at Piftsburgh plant, including installation of additional equipment.

PHILADELPHIA—Resinous Products & Chemical Co., 222 West Washington square, plans four-story plant, costing close to $100,000 with machinery and power equipment.

Michigan

ANN ARBOR, MICH.—Ayres, Lewis, Norris & May, Ann Arbor, have been appointed engineers for the contemplated municipal light plant which would serve city of Watervliet, village of Coloma and Watervliet and Coloma townships.

BATTLE CREEK, MICH.—G. O. Lewis Co., Battle Creek, has been awarded contract for construction of an addition to factory of the Wilcox-Rich division of Eaton Mfg. Co. in Battle Creek.

DETROIT—Motor City Paper Tube Co., 13911-21 Meyers road, has been organized with $10,000 capital to manufacture paper and metal containers; Albert A. Schaerer, Detroit.

GRAND RAPIDS, MICH.—United Heating Inc., 934 Grandville avenue, Southwest, has been incorporated with $25,000 capital to manufacture heating units; Charley Dadd, 1308 Walker street, Northwest.

MONROE, MICH.—Monroe port commissioners, care of John S. McMillan, chairman, will take bids due 2 p.m., Dec. 29, for two gantry-type traveling cranes, electrically-driven with capacities up to 6000 pounds.

OWOSSO, MICH.—Hy-glo Products Co. is planning to construct a 100 x 120-foot factory building early in 1940.

Illinois

CHICAGO—Sears, Roebuck & Co., West Arthington and South Homan streets, plans installation of complete air conditioning system in new three-story retail store it plans to erect in Phoenix, Ariz., early in 1940. Company engineering department is in charge.

FRANKLIN PARK, ILL. — Franklin Park Frozen Foods Inc., recently organized, care of Worthman & Hallman, 5736 North Richmond avenue, Chicago, architects, plans boiler house at new plant here where property has been purchased. Will install cold storage and refrigerating equipment. Cost estimated at $150,000.

Indiana

BROOKLYN, IND.—City will install two 300-gallon-per-minute, motor-driven, deep well, pumping units, with gas engine standby equipment, in connection with improvements in municipal waterworks system. Harry O. Garman, Indiana Pythian building, Indianapolis, consulting engineer.

Delaware

EDGE MOOR, DEL.—E. I. du Pont de Nemours & Co., Wilmington, Del., will install electric power equipment in an addition to its titanium pigment plant here. (Noted Nov. 13).

Maryland

BALTIMORE—Consolidated Gas, Electric Light & Power Co., Lexington building, has approved plans for further expansion in steam-electric generating station at Westport, including installation of new 67,000-horsepower turbine generator unit, boilers and auxiliary equipment. Entire project to cost about $8,000,000.

HAGERSTOWN, MD.—R. J. Funkhouser Co., Charleston, W. Va., R. J. Funkhouser, president, will make extensive improvements to plant it has acquired here.

District of Columbia

WASHINGTON—Office of general purchasing officer, Panama Canal, will open bids Dec. 28, 10:30 a.m., schedule 3802, tractors, (Caterpillar tread); schedule 3800, diesel engine powered crawler units; Dec. 29, schedule 3795, bolts, nuts, plate washers, ogee washers, lock washers, rivets, screws, expansion shields and bolts and toggle bolts; Jan. 2, schedule 3798, material for barge tracks (tracks, anchors and accessories); Jan. 4, schedule 3797, pipe fittings, pipe straps, cocks (bibb, steam, stop and corporation), steam hose couplings, and hose clamps.

WASHINGTON — Bureau of supplies and accounts, navy department, will take bids until 10 a.m., Jan. 2, schedule 159, one motor-driven sensitive radial drill, delivery Puget Sound, Wash.; schedule 162, two motor-driven, all-geared, head turret lathes, delivery Norfolk, Va.; schedule 160, copper-nickel alloy seamless annealed tubing, delivery Puget Sound, Wash.; schedule 183, arc welding machines; panels, welding outlet, delivery Portsmouth, N. H.; schedule 192, one motor-driven welding positioner machine, delivery Philadelphia; schedule 198, one motor-driven precision bench lathe, delivery San Pedro, Calif.; schedule 207, gear motors, with controllers and spare parts, delivery Philadelphia; schedule 186, one motor-driven universal and tool grinder with accessories, delivery Brooklyn, N. Y.; schedule 187, four motor-driven, pedestal-type, size 14-inch wheels, wet, double end grinders, delivery Philadelphia; schedule 188, one motor-driven, 36-inch, wet tool grinder, delivery Philadelphia; schedule 195, four portable multiple arc welding sets, delivery Puget Sound, Wash.; Jan. 5, schedule 164, one air-operated, self-contained tool dressing hammer, delivery Alameda, Calif.; schedule 165, two motor-driven, plain, vertical, milling machines; schedule 167, one motor-driven, universal, horizontal milling machine; schedule 170, one motor-driven, light-duty engine lathe, delivery San Diego, Calif.; schedule 208, nickel-copper-alloy

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bars and rods, delivery Portsmouth, N. H.; schedule 181, one motor-driven screw machine, delivery Mare Island, Calif.; schedule 185, two motor-driven precision toolmakers lathes, delivery Norfolk, Va.; schedule 200, jig and tilting arbor saws, sanders and grinders, motor driven, delivery Alameda, Calif.; schedule 205, one motor-driven, high-speed radial drill press, delivery Philadelphia; Jan. 9, schedule 226, one motor-driven, medium-heavy duty engine lathe, with six sets of carbon brushes, delivery San Pedro, Calif.; schedule 248, steel tap rivets, delivery Norfolk, Va.

Kentucky

LEBANON, KY.—City plans erection of sewage treatment plant. J. S. Watkins, McClelland building, Lexington, Ky., engineer. Bids will be taken Jan. 18.

Florida

FORT LAUDERDALE, FLA.—City, J. H. Philpott, city manager, will take bids Jan. 4 for water mains, filters, wells, pumping equipment, etc. Estimated cost $192,948.

FORT LAUDERDALE, FLA.—Shell Oil Co., Shell building, St. Louis, has acquired site here for erection of petroleum products distribution plant and tank farm. Estimated cost $1,000,000.

HOMESTEAD, FLA.—Work will begin soon on improvements in municipal power plant and waterworks station, including installation of 600-horsepower diesel-generator unit and auxiliary equipment. Fund of $75,000 has been secured through federal aid.

LAKE CITY, FLA.—Veterans administration, Arlington building, Washington, will take bids Jan. 9 for air conditioning and ventilation equipment for veterans administration here. Project 1728.

Missouri

ST. LOUIS—Union Electric Co. of Missouri, W. McClellan, president, Twelfth and Locust streets, plans new power plant at Venice, Ill.; will install two 300,000-pound per hour boilers in Ashley street plant in St. Louis, and will make changes in equipment at its Madison county, Iowa, plant. With other improvements, total expenditure is estimated at $20,000,000.

Wisconsin

WAUKESHA, WIS.—Waukesha Foundry Co., Lincoln avenue, has let general contract for one-story addition, 80 x 120 feet. Cost about $60,000 with equipment.

Minnesota

MOORHEAD, MINN.—City, R. G. Price, clerk, is taking separate bids to Jan. 3, 10 a.m., on a turbogenerator with auxiliaries and one surface condenser with auxiliaries for its municipal power plant. Helmick, Edeskuty & Lutz, 412 Essex building, Minneapolis, consulting engineers. Certified check 10 per cent to accompany bid. (Noted Nov. 11).

SARTELL, MINN.—Village voters approved Dec. 5 a $14,000 bond issue to finance construction of sewage disposal plant. John Hovanes is village clerk.

Texas

EDINBURG, TEX.—McCullum Exploration Co., care of Burton McCullum & Associates, Esperson building, Houston, Tex., plans erection of recycling plant here, costing $1,000,000 or more.

Kansas

EMPORIA, KANS.—City, E. T. Mendel, clerk, is preparing preliminary plans for construction of an addition to sewage disposal plant. R. W. Cunningham is city engineer.

WELLINGTON, KANS. — Sumner-Cowley REA project, Harold Koger, president, has completed preliminary plans for construction of about 200 miles of rural transmission lines. C. H. Guernsey, 1216 South Grand avenue, Cherokee, Okla., consulting engineer.

North Dakota

GRAND FORKS, N. DAK.—City commission, John Hesketh, president, has completed preliminary survey for alteration of its water treatment, distribution and sewage disposal plants. Burlingame, Hitchcock & Estabrook, 529 Sexton building, Minneapolis, consulting engineers.

Iowa

GLADBROOK, IOWA — City, Harry Lundt, city clerk, has selected R. B. Slippy Engineering Corp., 412 Lafayette street, Waterloo, Iowa, as consulting engineer and is preparing preliminary plans for construction of sewage disposal plant and intercepting sewer to cost $25,000.

GOWRIE, IOWA—Board of trustees, E. J. Bruntlett, chairman, will take bids to Jan. 17, 1:30 p.m., on extensions to its municipal electric light plant, including one diesel engine having capacity of not less than 300 horsepower nor more than 375 horsepower, complete with generator, exciter, auxiliary equipment and piping. Plans obtainable from board or engineer, Stanley Engineering Co., Muscatine, Iowa.

Colorado

MONTROSE, COLO.—Estimates of cost are being prepared for municipal power plant.

RIDGE, COLO.—Board of directors, state home and training school, has plans for one-story boiler plant, 45 x 53 feet, including installation of boilers and auxiliary equipment. C. Francis Fillsbury, Midland Savings building, Denver, is architect.

Pacific Coast

LOS ANGELES—Heidemann Mfg. Co., maker of beauty shop fixtures, has begun construction of new plant containing 4000 square feet of floor space.

LOS ANGELES—Zierold Metals Corp. has been organized with capital stock of $50,000. Directors are: Herman and E. M. Zierold, Burbank, Calif., and Adams Hemmes, Los Angeles.

MEDFORD, OREG.—Beaver Portland Cement Co., W. H. Nuirhead, president, is building a 1500-kilowatt hydroelectric plant on Rogue river, estimated to cost $150,000. R. L. Stuart & Sons, Medford, have general contract.

SUNNYSIDE, WASH.—Bids will be received Jan. 4 for pumphouse, pumps and control system for municipal waterworks; G. D. Hall, Yakima, Wash., engineer.

TACOMA, WASH.—City officials plan appropriation of $150,000 for municipal light and power development survey, involving extension of electric generating system and expansion of power capacity.

VANCOUVER, WASH.—Vancouver Plywood & Veneer Co. will soon complete additions in drying department to expand capacity 30 per cent. New driers and other machinery will be installed. John Power, plant manager.

VANCOUVER, WASH.—Port of Vancouver has leased a building on port property to Vancouver Sash & Door Co. Inc., which plans installation of new machinery and equipment, electrically driven. J. H. Meyers and A. J. Langhardt are the owners.

WALLA WALLA, WASH.—E. H. Lee, northwest manager, Continental Can Co., has plans for a $500,000 plant to be established here in 1940.

Canada

MONCTON, N. B.—Canadian National railways is considering plans for erection of a new $500,000 erecting shop near the present plant here.

RIVERSIDE, N. S.—George P. Graham, King street, Riverside, Parrsboro, N. S., plans erection of sawmill here.

GALT, ONT.—H. Lunenfeld & Son Ltd., 200 Beverley street, plans two additions to factory here, one 16 x 32 feet, the other 41 x 85 feet.

GREENFIELD PARK, QUE.—Intrepid Time Recorders Ltd., 1502 St. Catharine street, West, Montreal, will erect a manufacturing plant on Devonshire road here.

OSCEOLA, ONT.—Puritan Mines Ltd., 18 Rideau street, Ottawa, plans to erect a molybdenite plant here with 50 tons per day capacity. Cost over $25,000. H. H. Claudet, 173 Daly avenue, Ottawa engineer.

PETERBORO, ONT.—Canadian General Electric Co. Ltd. will make plant extensions and improvements, spending about $50,000.

SAULT STE. MARIE, ONT.—S. V. McLeod, purchasing agent, Algoma Steel Corp., is receiving bids for materials in connection with addition to double capacity of tin plate and sheet mill.

TORONTO, ONT.—Canadian Breweries Ltd. will build a $120,000 addition for O'Keefe's Brewing Co. Ltd. at Victoria and Gould streets. An additional $50,000 will be spent on power and refrigerating equipment. Work scheduled to be completed in March.

TORONTO, ONT.—Morgan Paper Co., 925 Dufferin street, has acquired new site at Van Horne street and Gladstone avenue, for erection of factory, 45 x 150 feet. E. Steadman, 472 Castlefield avenue, architect.

TORONTO, ONT.—Glidden Co. Ltd., 370 Wallace avenue, has awarded contract to J. G. Kent & Sons Ltd., 1221 Bay street, for plant addition to cost $60,000. Mathers & Haldenby, 96 Bloor street, West, architects.

BEAUHARNOIS, QUE.—St. Lawrence Metals & Alloys Ltd. will erect plant addition here to cost $25,000.

GRANBY, QUE.—Bolta Ltd., Lawrence, Mass., will erect plant here and has let general contract to Alphonse Langlois, 42 St. Antoine street, Granby.

GRANBY, QUE. — Steadfast Rubber Co., 400 Cowie street, will build a $60,000 factory on St. Charles street, for which general contract will be let immediately. Norman Melanson is engineer.

KEWAGAMA, QUE. — Wood-Cadillac Mines Ltd., 437 St. James street, West, Montreal, Que., will construct a mill on its property here to cost $225,000. Julius M. Cohen is engineer.

LAC MEGANTIC, QUE. — Philibert Cliche plans erection of a one-story, 75 x 225-foot plant here for production of war munitions, shells, etc., to cost $25,000.

ST. LAURENT, QUE.—Beaver Products Ltd., St. Janvie, Que., will build a factory here to cost $25,000. Paul M. Lemieux, 1260 University avenue, is preparing plans.

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Bids Wanted

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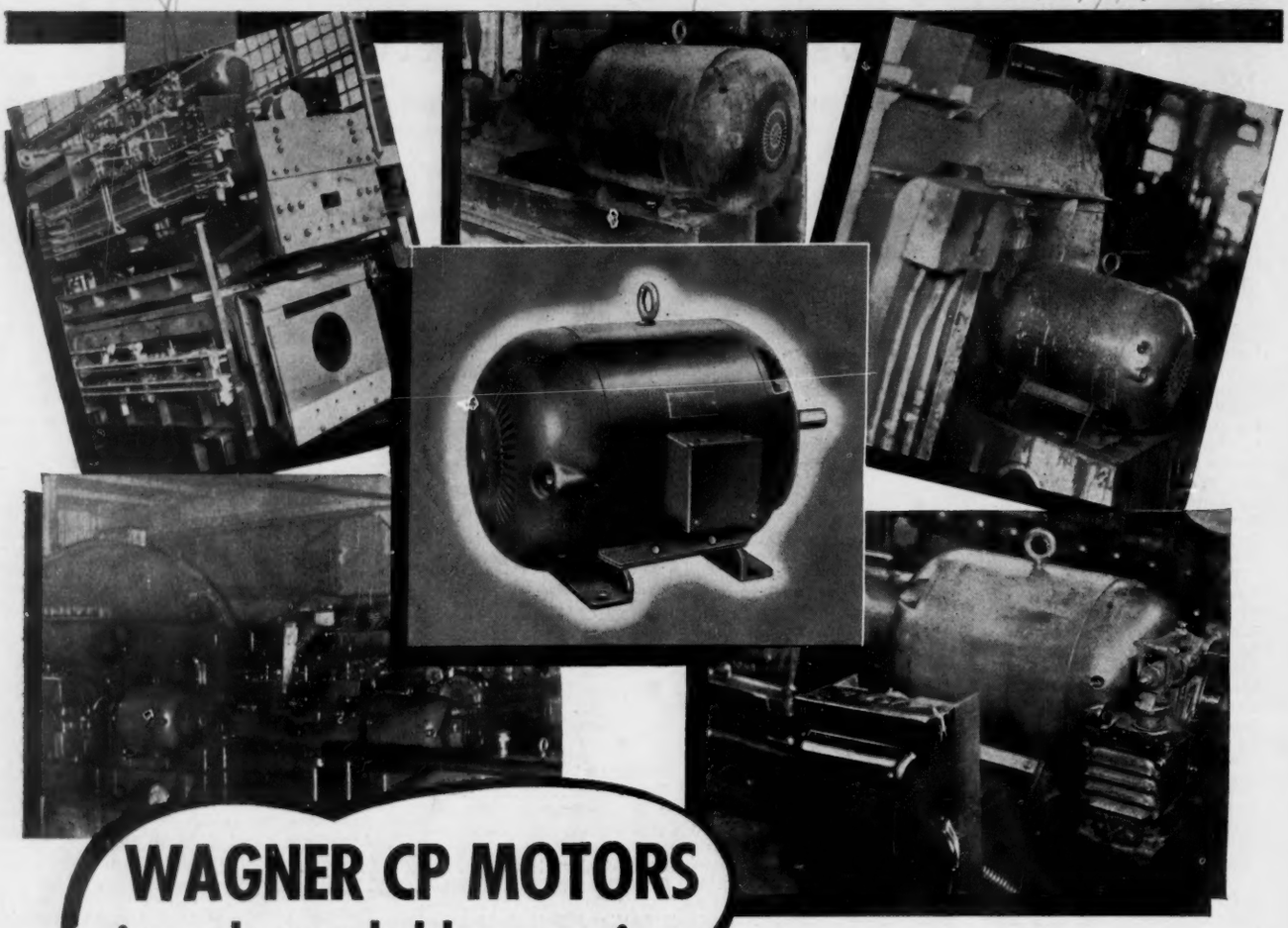

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